



FRIDAY, OCTOBER 11, 1878.

## Davis' Improved Car Dump.

We give herewith an engraving of an arrangement devised and patented by Mr. Eugene Davis, of Clinton, Ill., for unloading grain, coal or ore from ordinary box cars. It will be seen that the arrangement consists of what may be called a tilting frame, on which the car is placed, and then elevated into the position shown in the engraving, so that the contents of the car will run out of end doors into suitable shutles or receptacles, from which it is conveyed to other cars, vessels or bins. The operation of this invention is described as follows by the inventor:

"In the construction of this machine the railway track at the right-hand end is about one foot lower than at the left-hand end, so that after the car is unloaded it will run off the tilting frame by its own gravity. The length of the frame is such as to allow the cars to be placed on one side of the centre, or about two feet nearer to the shute into which the contents are to be unloaded, than it is to the other end, so that when the bars which hold the tilting frame in a horizontal position are pulled back, the end of the car from which it is to be unloaded will descend by its own weight, until the bottom of the car body comes even with the top of the shute, as shown in the engraving. Then, by raising the end door in the car its contents will run out into the shute.

"The point of suspension of the tilting frame is so adjusted that when the car is placed on the frame its load will cause it to tilt into the position shown, but when it is unloaded the empty car will cause the frame to tilt back into its original position.

"In unloading a car it is held on the frame by chains, shown in the engraving, which are hooked into rings in the side of the car to prevent it from running off the frame. The frame, after it is tilted, is held in that position by a pawl or brake until the car is unloaded. Then the pawl or brake is released and the frame is allowed to tilt back to its original position, the chains are disconnected and the car is run off the frame.

"In case a car should be unevenly loaded, that is, if the heavy load should be at the opposite end from the one to be unloaded, so that the car should not descend by its own weight to the shute, then one man at the crank-shaft or wheel can turn it down.

"This, it is claimed, is the quickest method known for unloading cars or transferring loads of grain, coal, ore, etc. The time required to unload a car would not be over two minutes, and the cost would not exceed  $\frac{1}{2}$  cent per ton."

The inventor is Mr. Eugene Davis, of Clinton, Ill., who can be addressed at that place for further information.

## Contributions.

## Development of Eastern Washington Territory on the Route of the Northern Pacific.

NEW TACOMA, Washington Territory, Sept. 22, 1878.  
TO THE EDITOR OF THE RAILROAD GAZETTE:

I have just returned to this place after an absence of over five weeks, during which period I have crossed over the Cascade Range of mountains into the Yakima valley, down that valley to its mouth, thence across the Columbia River to Wallula, and over the narrow-gauge railroad (32 miles), thence to Walla Walla. From Walla Walla I went out over the "Palouse country," as it is styled, and through that to the valley of the Spokane to the Great Falls of the Spokane—second only, in magnitude and beauty, to Niagara. The located line of the Northern Pacific Railroad passes within a short distance of the falls. The total fall, in a distance of less than half a mile, is 156 feet, and the volume of water, with the stream in its very lowest stage, as I saw it, is very great.

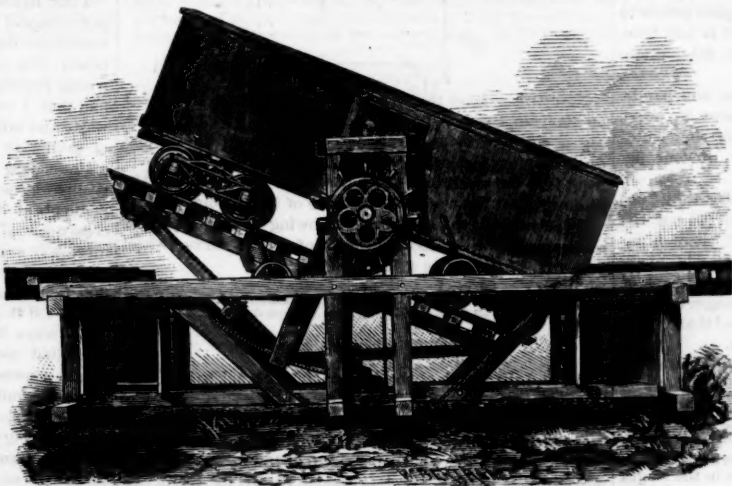
Nine years ago I made my first exploration on horseback through this portion of Washington Territory, when for several hundred miles after passing Waitsburg—about eighteen miles beyond Walla Walla—there was only one settlement. Much of the country was covered with bunch-grass, and I regarded it and reported it to be a very valuable grazing region. At that time the people who had settled and farmed about Walla Walla depended entirely upon irrigation for their crops, and it was generally considered that the extensive rolling hill lands could never be farmed because irrigating water could not be conveyed to them. A few years later it was discovered that irrigation, in all that part of Washington Territory, was not needed, and that crops of 30, 40, 50 and 60 bushels per acre of the finest wheat in the world could be raised without any irrigation.\* Since then the country has been rapidly settling; not only in Eastern Washington, but in Eastern Oregon adjoining, and in Western Idaho. Whitman County, in Washington Territory, which had no existence as a county, and where

\* A gentleman who was in Walla Walla in 1870 informs us that it is a very prolific fruit region, and that he then saw very fine grapes and peaches, the latter fully equal to those of Delaware, and ears of sweet corn as large in diameter as an ordinary man's wrist.—Editor.

there was scarcely a settlement when I traversed that region in 1869, now has over eleven hundred voters, and immigrants are pouring in all the time. I met thirty families going in during the two days I was traveling from Colfax to Walla Walla, about 85 miles.

The country is, for the most part, treeless; and very generally the fields are so smooth that all the work—sowing, harvesting and threshing—is done by machinery. The wheat is put into bags in the field, and the farmers have no fear of rain till the fall, when their products are either stored or shipped to the Columbia River. What the people there need is a railroad through their great wheat empire, to convey the grain cheaply to the ports on Puget Sound.

The narrow-gauge railroad between Walla Walla and the Columbia was built through the enterprise of one man, Dr. Baker, who had only limited means, and who pushed it through in spite of many difficulties. It is now transporting daily to the river three hundred tons of wheat in sacks, and notwithstanding the facilities of steamers on the river, and portage railroads at the Dalles (14 miles), and at the Cascades (6 miles), the wheat is daily accumulating, both at Walla Walla and at Wallula. The amount of farm machinery which has passed up the Columbia River and gone into the great wheat region, is almost fabulous. There are four other principal depots for receiving and shipping wheat on Snake River, entirely distinct from the Walla Walla region; and since the beginning of September river shipment from there has ceased on account of low water in the Snake River, and navigation is not likely to be resumed on that stream before May. The people there see and feel the necessity for a railroad outlet, and are praying for the construction of the Northern Pacific Railroad across Washington Territory. The line was located in 1872, but since the panic of 1873 nothing has been done on that portion of the company's road. The surveys now being made by the company, run-



DAVIS' IMPROVED CAR DUMP.

ning through Washington Territory, across the Cascade Range to Tacoma, the terminus of the present line from the Columbia River, may result in establishing it as the outlet for a large portion of the wheat-producing region already mentioned.

Knowing the interest you have always taken in connection with the internal improvements of our country, I have hastily sketched the foregoing for your information.

W. MILNOR ROBERTS.

## A Train a Mile and an Eighth Long Hauled by One Locomotive.

WILLIAMSPORT, Pa., Sept. 30, 1878.

TO THE EDITOR OF THE RAILROAD GAZETTE:

A telegram received to-day from Mr. Thomas Gucker, Assistant Superintendent, Susquehanna Division, Northern Central Railway, mentions that one of their consolidation engines hauled from Clark's Ferry to Sunbury the following train, viz.: 183 empty eight-wheeled cars and one loaded car, one dead engine and two cabooses.

This was not on any special trial but occurred in the ordinary running of the road, and was owing to the engine of one train having become disabled, when the succeeding train, on passing it, backed on to the train and took both trains and dead engine on to destination, making two stoppages for coal and water of, in all, 25 minutes, leaving the actual running time 3 hours 25 minutes for a distance of 39 miles. The length of the train, which is probably the longest ever hauled in practical railroading, was 5,904 feet, and its weight 3,694,000 pounds.

It was hauled over a road with a slightly opposing grade of about four feet to the mile, around frequent curves of four and five degrees, at an average speed of 10 miles per hour.

The particular type of engine used is known on the Pennsylvania Railroad as "Class L," which has frequently been described in your journal.

It is of course well known that the tractive power of these engines is sufficient to handle trains of this weight, but the difficulty in this case was the extreme length of the train, the cars being empty; and it speaks well for the ability and training of the train-men that they should feel themselves competent in the ordinary course of business to undertake such a task and without special orders.

The train was hauled by Engine No. 40, Robert Burgoon, Engineer, and Charles Sarvis, Conductor.

HOWARD FRY.

## Comparing the Value of Cast-Iron and Steel-Tired Wheels.

CHICAGO, Oct. 4, 1878.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Always an interested reader of your excellent paper, I have been specially entertained by your carefully prepared article "Steel-tired Wheels and Cast-iron Wheels Mathematically Considered." This is a subject now engaging the attention of the management of all first-class railroads (in fact is one of the chief topics of conversation in all departments from the Manager's office to the shops), therefore it is but natural that your article would be pretty thoroughly canvassed by those of us practically engaged in the particular department to which it refers; and as one of those it has occurred to me that you have over-looked one or two very important items connected with the subject, and one of more importance than all others in the estimation of those of us who are brought in direct personal contact with that most important item of railroad expenditures—repairs.

Now, while we have never used the steel-tired wheel ourselves, I have watched their use upon other roads with much care and have particularly noticed this great advantage—that they are perfectly round, while it is well known to all practical men connected with the business that not one iron wheel in a thousand is perfectly so. Therefore in the former there must necessarily be an immense saving in the expense of maintenance of trucks, a very material increase in the life of the axle and consequent relief to rail and road-bed. Now, ought not the above to be considered in an elaborately prepared calculation like that made by you, and would not the result prove even more favorable to the steel-tired wheel than your last article? These facts can readily be obtained from the various roads using the steel-tired wheel and would prove of interest to your readers. Then, again, are all steel-tired wheels alike valuable? Are all alike safe? Is there not an elasticity about some that others do not have? Are there not other advantages? Will not a steel-tired wheel adhere more closely to the rail? Is it not less likely to slide by an indiscreet and reckless use of the brake? I don't know that I ever saw a flat steel-tired wheel. Now, Mr. Editor, don't understand me as an advocate of steel-tired wheels. I am in search of information, and as you have opened up the subject it has occurred to me that there might be valuable information yet to come.

MECHANIC.

[The only question which the article referred to was intended to answer is, Which costs the most in money paid out, the service in miles run of cast-iron wheels or the service of steel-tired wheels? It may be that some advantages, such as our correspondent has pointed out, attend or accrue from the use of steel-tired wheels, which have no direct connection with their cost;

but at present we have no evidence of this, excepting that he and some other persons think so in a somewhat vague and uncertain way. It is possible that the repairs of both the trucks and the track will be less if turned steel-tired wheels are used instead of chilled wheels, but before it is safe to assign any importance to such advantages, some conclusive evidence is needed to prove their existence, and show how much and how little value they have. If our correspondent or any one else has any evidence bearing on this matter, we would be glad to receive it.—EDITOR RAILROAD GAZETTE.]

## Three Dollars Fine for Driving Over this Bridge Faster than a Walk.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The above notice is placed at the end of a new bridge, over which, by the way, a good deal of fast driving is done. A part of the bridge is of iron and is built in the bowstring form. I wish to ask your bridge-building readers a few questions in regard to this structure, and I hope some one will take the pains to answer the questions, since several bridges of the same kind have recently been opened for travel in this neighborhood, one of them being in the main street of a good-sized town, where there is considerable heavy teaming and where crowds of people often collect to look at freshets. One of the spans in question is 112 feet long, the rise of the arch  $12\frac{1}{4}$  feet, and the clear width between the two girders 17 feet. The arch for each girder has a sectional area of about  $7\frac{1}{2}$  square inches, and the horizontal member, or lower chord, a section of 5 square inches. The vertical suspenders are  $9\frac{1}{2}$  feet apart. The lower chord or horizontal member of each girder is composed of two flat bars, each 5 inches deep and half an inch thick, placed on edge about 3 inches apart laterally. These two bars are entirely disconnected, except at the feet of the vertical suspenders  $9\frac{1}{2}$  feet apart, where they are not, strictly speaking, fixed but held, being clamped by a screw between two small horizontal castings, badly fitted. The floor joist, of  $2 \times 12$  plank, rest directly on top of the two bars, with no fastening whatever, there being five or six of these joist between each two verticals. In an adjoining and shorter span the suspenders are 10 feet apart, and the lower chord bars are each 4 inches deep and half an inch thick.



My first question is this: Will two iron bars 10 feet long, 4 inches deep, and half an inch thick, placed horizontally on one edge, two or three inches apart, and not confined or secured in any way laterally, except at the ends, support safely one-half of a 17-foot roadway, carried by 2x12 joist which rest at intervals of about two feet on top of the bars, supposing the two bars to fail by cross strain and not to turn over sideways. This is, of course, a very simple question, being two horizontal girders of 10 feet span, fixed at the ends, and uniformly loaded. My second question is this: How much of uniformly distributed load will two such girders safely hold before turning over sideways, supposing them to be well fixed at the ends. My third question is this: How much would two such bars of indefinite length, say 100 feet, hold safely where they are not well fixed laterally, but simply held at each 10 feet by being clamped between two horizontal pieces of iron, badly fitted. I may add that at one place one of the bars in question, 4 inches deep, is already twisted  $\frac{1}{2}$  of an inch out of the vertical plane. My last question is: Would not the proper notice to put up at the end of such a bridge be:

DANGEROUS BRIDGE! NO PASSING.  
GEO. L. VOSE.

#### Curve Resistance as Affected by Gauge of Track.

BELLEWOOD, Oct. 5, 1878.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of the 4th inst., in commenting on my statement, "that the resistance due to curves was so much greater on broad gauge than on the narrow gauge, curves equal, which I find to be as 10 to 16," you say: "It will be noticed that the fact is entirely unsupported by evidence, and rests wholly upon the assertion of our correspondent that 'it can be demonstrated;' therefore, it is quite proper to present evidence to show that the assumed fact is not true, and that any reasoning based upon it rests on false premises."

Now, I propose to demonstrate that it is true, and can be proven to be true by the very figures you present to prove its fallacy, and I want no better evidence in support of my statement than that given by an analysis of your figures.

Before commencing this analysis, I wish to say that "the difference in the length of inner and outer rail" is not the "only reason for the difference in resistance." There is another reason, and that is owing to the increased wheel-base of a 4 ft. 8 $\frac{1}{2}$  in. truck, as compared with the wheel-base of a 3-foot truck, the angle at which the wheel-flanges impinge against the rails is "much greater" on the broad than on the narrow-gauge. I shall refer to this further on.

You reprint from your issue of Aug. 25, 1876, the following article:

"Let us take a curve of 300 feet radius, than which there are very few shorter, even on narrow-gauge roads. The circumference of a complete circle of 300 feet radius would be 1,884.96 feet. It is a well-known fact, which can be easily proved geometrically, that the difference in the length of two rails in a complete circle of a curve of any radius is equal to the circumference of a circle whose radius is the gauge. Therefore, the difference in the length of the rails in a complete circle of 300 feet radius, if the gauge is 4 ft. 8 $\frac{1}{2}$  in., will be 29.58 ft., and on a 3-ft. gauge, 18.84 ft.; so that the difference would be 10.74 ft.; or, in other words, the wheels on one side must slip 10.74 ft. farther on the wide than on the narrow gauge. It must be remembered, however, that it is only the wheels on one side which must slip, so that for every ton (of 2,000 lbs.) of weight carried around such a curve, a load of half a ton must slide a distance of 10.74 ft. Now to slide a wheel on a rail requires a force of about one-fifth the weight, so that the difference in the power absorbed in sliding the wheels on the one gauge as compared with the other will be for each ton of load one-fifth of 1,000 lbs. = 200 lbs. As already stated, the total difference in the distance which the wheels must slide in running around the whole circle or 1,884.96 ft. is 10.74 ft., so that the actual difference in the power which must be exerted at any one time to draw each ton on the curve named on the one gauge as compared with the other is

$$\frac{10.74 \times 200}{1,884.96} = 1.1 \text{ lbs.}$$

For the above many thanks; it contains all the proof necessary to sustain my claim. We will continue your figures and try and find what the resistance is on each gauge, and then we can better judge whether the 1.1 lbs. is a large reduction or a small one.

The resistance due to slipping on each gauge would be, according to your rule:

Standard gauge.....	$\frac{29.58 \times 200}{1,884.96}$	= 3.14 lbs. per ton.
Narrow gauge.....	$\frac{18.84 \times 200}{1,884.96}$	= 2.00 " "
Difference in favor nar. gauge.....	$\frac{10.74 \times 200}{1,884.96}$	= 1.14 " "

You give the difference only, without showing the other figures, and as 1.14 lbs per ton is a small amount in itself, it is natural to jump at a conclusion, and say that the resistance is not "much greater," and that Mr. Ramsey is wrong; but when we discover that this 1.14 lbs. is fifty-seven per cent. of the entire resistance on a narrow gauge, due to the difference in length of outer rail, it becomes apparent at once that that the resistance is "much greater" on broad than narrow-gauge roads.

Now, to obtain the curves for each gauge, upon which this resistance will be equal, we have the following proportions, assuming the broad-gauge curve to be 19°, as above:

1. As 2.00 lbs. : 3.14 lbs. :: 19° : 29.83°.
2. As 19° : 29.83° :: 10° : 15.7°.

That is, a 19° curve broad-gauge is equal in resistance to a 29.83° curve on the narrow, and a 10° curve to a 15.7°

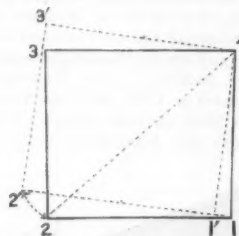
curve. To test the above results we will see what the resistance would be on these respective curves:

Standard-gauge circumference of curve.....	$\frac{29.58 \times 200}{3,290.47}$	= 1.84 lbs.
Narrow-gauge circumference of curve.....	$\frac{18.84 \times 200}{2,293.37}$	= 1.64 lbs.

I admit my error. I claimed 10 to 16 as the ratio; you will only admit 10 to 15.7 as the difference. I accept the correction, and hereafter we will give the difference as figured by you as above—10 to 15.7.

I beg leave to differ from you, however, regarding the amount of resistance per ton due to the slipping of wheels on curves. You claim that, as the wheels on one side only slip, for every ton of load, a load of only half a ton must slide a distance equal to the difference between outer and inner rails. I claim that the resistance must be calculated on the whole ton; thereby doubling the figures given and approximating nearer to the resistance that is practically shown by experiments to be due to curves.

The four points at which the wheels of a truck rest on the rails are really the four corners of a rectangle whose sides are as the gauge and wheel-base. Now it is a simple geometrical fact, that to move any corner of a rectangle, fixed or pivoted at one corner, the movement of the other three corners is to the movement of any one of them as their distance is from the fixed corner, as shown by the following diagram:



Now, it is evident that the leading inside wheel, marked 1 on diagram, cannot slip back a distance of one foot in rounding a curve, without causing a corresponding diagonal and cross-slipping motion in wheels Nos. 2 and 3. This movement is to the movement of No. 1 as their distance from the leading wheel No. 4 is to the distance of No. 1 from No. 4.

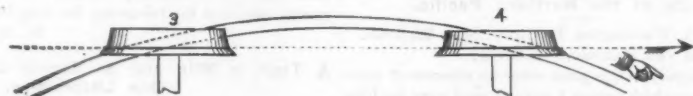
By calculation we obtain the following as the slipping of each wheel for each foot in length of a 10° curve—wheel base 4 ft. 11 in., gauge 4 ft. 8 $\frac{1}{2}$  in.

- (1)  $\frac{29.58 \times 1}{3,600}$  = 0.00821 ft., movement of wheel No. 1.
- (2)  $\frac{10^\circ \times 60}{100}$  = 6 minutes, angle turned.

We find the length of the diagonal of the truck to be 6.8 ft.

- (3)  $0.00174 \times 6.8 = 0.01186$  ft., movement of wheel No. 2.
- (4)  $0.00174 \times 4.91 = 0.00854$  ft., " " No. 3.

Collecting, we have a total of 0.02961 ft., or an average of 0.00715 ft. for each wheel, or only 0.00106 ft. less than the movement of the first wheel. Although I have, for ease of calculation, considered the leading wheel as without any side motion, it is certain that this wheel has a side-slipping motion, due to the fact that on sharp curves the flange impinges against the rail about three inches in advance of the point of contact between wheel and rail, and by its grinding action causes the wheel to slip sideways in running the curves. This can be better shown by the following exaggerated plan of the two outside, or Nos. 3 and 4 wheels on a curve.

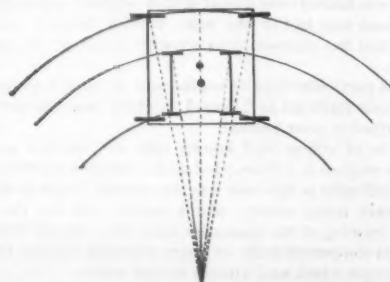


Now, in running in the direction of the hand, the wheel 4 must have a side movement, as it would, unless twisted to the right, continue in the direction of the arrow. Taking this view of the problem, we will have enough movement of the fourth wheel to bring the average for the four wheels to 0.00821 ft.

That being the case, the figures we have as the resistance due to slipping must be doubled, and we have:

Broad-gauge.....	$\frac{29.58 \times 400}{1,884.96}$	= 6.28 lbs., instead of 3.14 lbs.
Narrow-gauge.....	$\frac{18.84 \times 400}{1,884.96}$	= 4.00 lbs., " " 2.00 lbs.
Difference.....	$\frac{10.74 \times 400}{1,884.96}$	= 2.28 lbs., " " 1.14 lbs.

As a curve of 300 ft. radius is nearly a 19° curve, the resistance due to it would be, according to Mr. Chanute, 9 $\frac{1}{2}$  lbs. per ton on the broad-gauge; or 3.22 lbs. more than we



calculated as due to length of rails. This difference shows that there is some other cause of resistance on curves than that due to the difference in the length of rails. This brings

us to the second reason that I have given for my claim, viz., the difference in the angles, between wheels and rails on the different gauges:

The wheel-base of broad-gauge freight-car trucks is ..... 4.9 ft.  
The " " narrow-gauge " " ..... 3.1 ft.

Now, as shown by the diagram (curve exaggerated) the flanges will impinge on the rail at a greater angle on the broad-gauge than on the narrow-gauge on the same curves.

By a simple calculation this angle, for each gauge, is easily obtained. As a line drawn through the bolster pin, perpendicular to the side of the truck and parallel with the axles, must always be on the radius of the curve, the front and rear axles travel parallel with the radius, but always a fixed distance in front and rear of the radius; and this distance will give the angle on any curve at which the wheels run on the rail:

	Wheel base.	Half the wheel base.	
Broad gauge..	4.9 ft.	2.45 ft.	$\frac{2.45 \times 10}{100} \times .6 = 14.7$ in.
Narrow gauge	3 " "	1.5 " "	$\frac{1.5 \times 10}{100} \times .6 = 9.0$ " "

The above calculation is based on a 10° curve, and will give us the following proportion, as 9° : 14.7° :: 10° : 16.33°.

This calculation gives us the ratios of 10 to 16.33, but as the change of one inch in the wheel-base would bring it down to 10 to 15.7, and as nothing less than reducing the gauge will reduce the latter ratio, we will let it stand at that.

Now, if anything can be proved by figures, rightly used, my claim has been proved, and I have shown that I have every geometrical reason for holding to the views that I have expressed.

Your figures, by which you endeavor to show that the percentage of saving is so small (after you have added in the resistance due to grades, velocity and journals), that, practically, it is of no consequence, are ingenious, but based on wrong principles. According to this doctrine of yours, if I find that I can reduce some one item of expense, say oil, waste and tallow, or coal, I am not to figure the percentage of saving in that account, but am first to add together maintenance of way, conducting transportation, and motive-power accounts; and then, if the saving is only 2 or 3 per cent. of the whole amount, it is "too small to be of any consequence." That policy won't work on railroads. We must save every cent we can.

The resistance due to difference in gauge with a curve of 300 ft. radius, as shown by calculation, is equivalent to a rise of 7.8 ft. per mile, instead of 3 ft.

I always thought that anything that decreased train loads (but used the same amount of power) would also in crease expenses of engineers, firemen and train-men; but you say it only increases the amount of coal used. I do not agree with you.

As the journals of the 24 in. narrow-gauge wheels are reduced in diameter in proportion to the reduction in the size of the wheels, the journal friction is about the same as that of the broad-gauge wheels.

In looking over your table of curves on narrow and broad-gauge roads, I find that out of 54 narrow-gauge roads reporting 26 reported curves from 65 ft. to 300 ft. radius. We have on the Bell's Gap Railroad 16 curves below 300 ft. radius, and 8 of these are 207 ft. radius, so that it must be borne in mind that curves of 300 ft. are not "rare" on narrow-gauge roads. Out of these 54 reporting roads we have

33 reporting curves below 400 ft. radius, and out of the large number of broad-gauge roads in this country, and you even go to Peru, you can only find 10 roads with curves below 400 ft. radius and four of these are temporary curves, viz:

Virginia Central, over Rockfish Gap Tunnel.....	300.0 ft.
Virginia Central, over Rockfish Gap Tunnel.....	238.0 ft.
Pennsylvania Railroad at Centennial.....	300.0 ft.
At Petersburg, during war.....	50.0 ft.

The curve on the Pittsburgh, Fort Wayne & Chicago at Pittsburgh, while it is on the main line, is between the Union Depot and the Pittsburgh, Fort Wayne & Chicago freight depot, right in the heart of the city. If any person will watch a few trains passing around it, or ask any Pennsylvania Railroad man about it, he will soon discover that it is a most serious draw-back to their traffic, and that they would do anything to get rid of it. They pass trains over it at about four miles per hour (when they don't stop entirely), and have special shifting-engines to run between Outer Depot, Allegheny and Union Depot.

As a mere matter of necessity, and in emergencies, curves can be used that it would be folly to continue to use any longer than forced to.

I believe the Elevated roads of New York are introducing a patent fixed and loose wheel to reduce the friction on curves.

The question is not, however, whether broad-gauge cars will run on curves of 200 to 300 ft. radius, but whether they will run on them with as little resistance as cars on the narrow gauge. You have admitted the fact that there is a difference in favor of the narrow gauge, but claim that it does not amount to the figures I claimed; I have proven that it does, and it requires but little investigation to show that my figures are correct. If the resistance on a ten-degree curve (broad gauge), is twice the resistance on a five-degree curve, it is so simply because the angle of deflection and dif-



ference in rails is twice that of a five-degree curve, such being the case (proven by actual experiments of Mr. Chanute and others), it becomes a fact beyond dispute, that, if a 15.7° curve on the narrow gauge presents the same difference in length of rail, and the same angle of deflection (to wheels) as that presented by a 10° curve on the broad gauge, the resistance must be the same on both.

I will furnish you the cross-sections that you desire just as soon as my regular duties will permit me.

If Messrs. Whinery and Wells had given the figures of their experiments, grades, etc., instead of simply the percentage of reduction, we might be able to tell something as to what the difference per ton due to curves alone would amount to; but as it is, we cannot tell anything about it. If the experiments were on grades, Mr. Wells' figures would exceed mine; if on level track, it would be less.

JOS. RAMSAY, JR.

#### Scheffler's Curve-Delineator.

Every engineer and draughtsman is aware of the inconvenience of drawing arcs of circles of large radius, especially when the location of the centre is confined to the space on a drawing board, or even to the room occupied by the draughtsman.

An instrument which is intended to overcome this difficulty is represented in the above illustration, which enables any one to draw arcs of circles from one foot radius to even a straight line. Two straight-edges, A and B, are connected at C by a small pivot as near the edges as practicable, and may, therefore, be placed at any required angle to each other, the point at C forming the vertex. The bar E holds the two straight-edges in the proper position by means of the set-screw F. A slot is cut in E at F to allow the variations of the angles. DD represents an adjustable pen or pencil-holder, shown also in the end view, fig. 2, with the pen inserted.

Fig. 3 illustrates the geometrical principle on which the use of the instrument is based. A given chord, a e, and the

exactly, then the nearest to it is to be taken. For instance, if a radius of 600 is given with a chord of 42, then  $\frac{42}{600} = 0.07$ ; but we find in the fourth column as chord 0.0698, which multiplied by 600 gives 41.88; the versed sine is  $0.0006$  or  $0.0006 \times 600 = 0.36$  for a chord of 41.88 and a radius 600.

If an arc of 20 degrees is required to be drawn of a radius of 50, then we find the chord  $0.3473 \times 50 = 17.365$  and the versed sine  $0.0152 \times 50 = 0.76$ . These dimensions may be feet, inches or any other measure.

Mr. Theodore Scheffler, of Paterson, N. J., is the designer and manufacturer of the instrument, which is patented. Further information can be procured by addressing him.

#### The Cost of Operating Narrow-Gauge Railroads.

The committee appointed at the convention held in Cincinnati last July to report on this subject have issued the following circular. The chairman of that committee writes that copies have been sent to all the narrow-gauge railroads in the United States and Canada, whose address they could obtain, but "to our great regret, only three railroads have responded." It is very much to be hoped that the committee will receive replies in time to make up a report based upon actual facts, because if it is true that narrow-gauge railroads can be operated for so much less than it costs to operate standard-gauge roads, then those interested in the latter and the public generally should know it. If, on the other hand, as many experienced persons think, it does not cost less but more to carry freight and passengers on a narrow-gauge line than it does on a standard gauge, then the people who held the convention in October should know it.

The undersigned having been appointed a committee to report upon the "Operating of Narrow-Gauge Railroads," by the National Narrow-Gauge Convention, convened at Cincinnati, July 17, 1878, would respectfully but emphatically urge upon all interested in narrow-gauge railroads the importance of at once reporting all facts in their possession relating to the operation of the narrow-gauge to this commit-

Box.....	
Flat.....	
Average cost of transfer per ton in cents.....	
Cost per mile:	
Construction.....	
Equipment.....	
Average train load:	
Number of passengers.....	
Tons of freight.....	
Received per mile:	
Per passenger.....	
Per ton of freight.....	
Proportion of dead to paying weight.....	
Average speed of trains:	
Passenger.....	
Mixed.....	
Freight.....	
Average daily number of trains:	
Passenger.....	
Mixed.....	
Freight.....	
Number of passengers conveyed one mile.....	
Number of tons of freight conveyed one mile.....	
Gross earnings per mile.....	
Net earnings per mile.....	
Operating expenses per mile.....	
Percentage of operating expenses.....	
Per mile:	
Number of track employees.....	
Number of other employees.....	

Reports should be made to the chairman of this committee at Rantoul, Ill. Each member of the committee will be pleased to answer any questions relating to said report.

AUG. W. WRIGHT,

Chief Engineer and General Superintendent Havana, Rantoul & Eastern Railroad.

W. W. BORST,

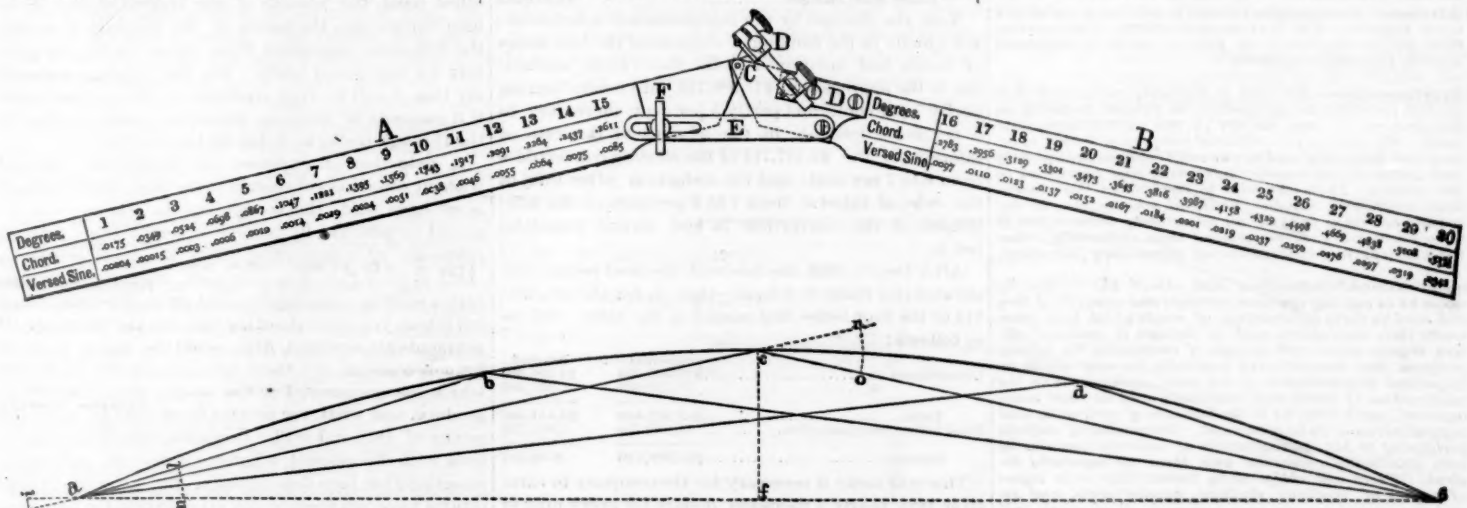
General Superintendent Denver & Rio Grande Railway.

GEORGE H. WILBUR,

General Superintendent Cincinnati & Eastern Railroad.

#### Pole Railroads.

Among the commonest contrivances adopted this summer for hauling logs are railroads of poles made through the woods, and worked sometimes with horses and sometimes



SCHEFFLER'S CURVE DELINEATOR.

versed sine, c f, are required, a e forming three points in the arc of the circle to be described. As all angles produced in the circumference of a circle between the points a e are equal, such as the angles a b e, a c e, a d e. Therefore, if two straight-edges are set so as to form the angle a c e, and are placed so as to bear against two pins at a and e, and the instrument with the pen placed at a is moved in the direction toward e, the edges kept lightly pressed against the pins at a and e. Then the arc a b c d e will be produced with the pen, the point of which should be placed as near as possible to the joint edges, and a little below the under sides.

The angle o c n is equal to one-half of the central angle subtended from the points a e, and the angle i a m =  $\frac{1}{2}$  o c n. If, then, a curve had to be constructed, and the length of the instrument would not admit of its being done directly with the given chord a e and the versed sine c f, then it is only necessary to use the points a and e as end points, and without further finding the versed sine of the arc a e set the instrument to the angle i a m instead of a c e, and produce the arc a c e and afterward c e; for, as shown above, the angle i a m is equal to one-half of the central angle subtended from the points a e. Reversed curves may be drawn from either point a or e by extending the chord a e in either direction and keeping the instrument at the same angle a c e; then any point on the extended line may be used as an end point of the reversed curve, and curves of any desired radius may be produced, according to the length of chord adopted beyond the points a or e. Also if the arc a c e is drawn with the instrument at the angle i a m, any desired curve may be drawn in continuation from e toward e, according to the length of chord adopted on the line c e or even the extended line beyond e, keeping the instrument at the angle i a m.

In using the instrument to find the versed sine, if the radius and chord are given with the help of the tables it is only necessary to divide the given chord by the given radius and find that proportion in decimal fractions. This represents the chord if the radius is = 1, then the corresponding number in the table of chords must be found and underneath it the versed sine will be given, which latter must be multiplied by the radius, and the result is the versed sine required. If the quotient of chord divided by radius can not be found

tee, and to this end the following blanks have been prepared; but it is to be hoped that you will not confine yourself entirely to the blanks, but having filled them out, you will add such other facts as you possess bearing upon this important subject. An early report is very desirable.

[In the blank the heads are at the top of columns, with horizontal lines for the different years or other periods. The position is reversed here for convenience in printing.]

Name of Road.....	Gauge in Inches.....
Year and number of months of report.....	
Proposed length of road.....	
Number of miles operated.....	
Maximum grade per 100 ft.....	
Length.....	
Maximum curve, degree per 100 ft.....	
Grade on maximum curve.....	
Number of locomotives.....	
LOCOMOTIVE RETURNS.	
Mileage:	
Total.....	
Average per engine.....	
Miles run to:	
Ton of coal.....	
Cord of wood.....	
Pint of oil.....	
Cost per mile in cents:	
Repairs.....	
Fuel.....	
Stores.....	
Miscellaneous.....	
Engineers, wipers and firemen.....	
Total.....	
Average cost of:	
Coal per ton.....	
Wood per cord.....	
Average number of freight cars in train.....	
Average cost per freight car per mile in cents.....	
Number of cars:	
Passenger.....	
Mail and baggage.....	
Stock.....	

with little locomotives. A correspondent of the *Northwestern Lumberman*, writing from Alpena, Mich., gives the following account of experience with such roads in that district:

Perhaps a line on pole-railroad experience may interest some of your readers. In this section we had a deal of trouble and tribulation in getting up the right pattern of wheel. The first pattern was too heavy, weighing 475 pounds to the wheel, and hugged the poles too closely, making it hard to draw the car. The next pattern, a 350-pound wheel, did pretty well on a smooth road. The third pattern could be used on a very smooth road, but on an ordinary road would run off the track too often, and the boys were getting discouraged. The fourth pattern, 32 inches high and 14 inches across the face from flange to flange, with deeper flanges (four inches in depth) reaching down further on the sides of the poles, and weighing 330 pounds per wheel, made the boys happy. They allowed they could run 'em successfully on a rail fence.

We used poles from seven inches to twelve inches in diameter, joining the ends by mortising. Sawing into the sides of the poles enables us to make the bends in the road and straighten refractory poles.

Not much fastening is needed for the poles. A few stakes, and braces against trees or stumps answer, as the wheels, having a double flange and nearly circular face embracing both sides of the poles, will draw them together or spread them apart as needed in passing over the road. Experience showed a six-foot gauge to be most suitable, as we could use a team inside the poles (or rails) and handle a load better than with one horse. We all propped up the poles too much to start with, and soon found that mother earth was the place for them to rest on. It is better to use the ax less and the grubbing hoe more. Axles made from three-inch round iron, and with five inches play sidewise on its bearing to each wheel, were found to be the thing.

There were a great many obstacles to be overcome, and the success in getting in logs over these roads is largely measured by the quickness of perception and fertility of resource displayed in disposing of them as they arise. Much depends, however, on the nature of the ground—whether level or undulating. Wet or swampy ground necessitates a deal of corduroy road which increases the expense rapidly. Probably the average extra expense of getting logs in over pole roads in summer, over winter work, would be 75 cents to \$1 per thousand feet. We haul from 1,000 to 1,600 feet per load, with two horses. The heat of summer, and annoyance from flies and mosquitoes, reduce the daily product materially, as compared with the results accomplished in cool weather. Our experience tends to show that these roads, worked by horse-power, as they must be, can only be successful over comparatively short hauls.





Published Every Friday.

CONDUCTED BY

S. WRIGHT DUNNING AND M. N. FORNEY.

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## EDITORIAL ANNOUNCEMENTS.

**PASSES.**—All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.

**ADDRESSES.**—Business letters should be addressed and drafts made payable to THE RAILROAD GAZETTE. Communications for the attention of the Editors should be addressed EDITOR RAILROAD GAZETTE.

**ADVERTISEMENTS.**—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

**CONTRIBUTIONS.**—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particularly as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

## THE PROSPECTS OF REORGANIZED ERIE.

When the Erie Railway company first found itself unable to pay all the interest on its bonds, and indeed before and since, we laid stress on the fact that the chief cause of the misfortunes of the company was its enormously inflated capital; and that, however much might be done by careful management and the much-needed improvements, for which capital was lacking, it would hardly be possible for any administration to satisfy the proprietors so long as their expectations were so extravagant. These expectations, however, seem not to have been greatly changed by the failure of the company to earn the interest on its bonds; for the plan of reorganization adopted after much discussion and consultation provided not for a smaller but a considerably larger capital, most of which was to be in mortgage bonds. It is true that it was expected when the plan was made that the increase in capital would be chiefly or wholly represented by new construction—by the additions to the property which were believed to be and really were and—what is worse—really are necessary to the economical working of the road. That is, it was supposed when default was first made that the road would be able to earn, very nearly at least, profits enough to meet the fixed charges, and therefore that the funding of nearly \$12,000,000 of coupons before 1881 would set free nearly that amount of profits to be applied to the second track, third rail, sidings, yards, stations, engine houses, new equipment, and the like, which the officers of the road had been asking for. But long before the foreclosure was effected it became evident that the net earnings would not nearly equal the fixed charges, and that therefore the \$12,000,000 added to the funded debt would in large part represent no addition to the property whatever, which, having been unable for some years to earn the old amount of interest, thereafter would be called upon to earn a larger amount.

The reorganization, however, was finally effected, substantially on the plan proposed. We published this plan when it was first issued, and have noted some modifications in it since; but these are not matters which it is easy to hold in one's mind, and it will be interesting, now that the reorganization is effected and the period for the resumption of full interest payments approaches, to see what the obligations are which the New York, Lake Erie & Western will be called upon to meet both now and in the following years until full interest will become due on all classes of the securities.

Occasion is given and material furnished for this examination by a circular issued by a London firm of stock-brokers, Messrs. Satterthwaite & Co., from which, with some corrections and elaboration, we take most of the figures here given.

Before the reorganization the funded debt of the company consisted of a number of old mortgages of small amount which are abundantly secured and the interest on which has always been paid, amounting in all to \$13,155,500, the interest on which is \$921,062.50 per year, and of the following bonds on which interest has not been wholly paid:

	Principal.	Interest.
Sterling convertible 6s.....	\$4,457,714	\$367,403
First consolidated 7s.....	12,076,000	845,320
Convertible 7s.....	10,000,000	700,000
Second consolidated 7s.....	15,000,000	1,050,000
Total.....	\$41,533,714	\$2,862,783
Add to these:		
Old mortgages.....	13,155,500	921,062
Long Dock, Buffalo Branch, Boston, Hartford & Erie guaranteed, Weehawken Dock and real estate mortgage bonds.....	6,003,360	449,511
Total bonds and interest.....	\$60,792,574	\$4,233,256
Rentals (about).....		742,226
Yearly fixed charges.....		\$4,975,482

Now, the changes by the reorganization scheme consist chiefly in the funding of coupons of the four issues of bonds first mentioned in the above table, amounting in the aggregate to \$11,988,746, into bonds bearing partly 7 per cent., and partly 5 per cent., increasing to 6 per cent. interest; in the advance of the rate of interest on the \$4,457,714 of the sterling convertibles from 6 to 7 per cent., and the reduction (after 1879) of the rate of interest from 7 to 6 per cent. on the \$25,000,000 of the convertible 7s and second consolidated 7s.

After Dec. 1, 1883, the bonds of the road proper substituted for those in default—that is, for the \$41,533,714 of the four issues first named in the table—will be as follows:

	Principal.	Interest.
Consolidated 7s.....	\$20,005,794	\$1,400,405
6s.....	33,516,666	2,011,000
Total.....	\$53,522,460	\$3,411,405
Total before reorganization.....	\$41,533,714	\$2,862,783
Increase.....	\$11,988,746	\$548,622

This will make it necessary for the company to earn, after 1883, nearly a thousand dollars for every mile of road that it owns more than was necessary before the foreclosure, in order to meet its interest charges.

But 1883 is a good way ahead, and it is interesting to know what the obligations will be meanwhile; for, as we have said, they vary from year to year, partly by the funding of coupons and partly by changes which are to be made in the rates of interest on some of the bonds and funded coupons.

The interest charges then, which will fall due in each calendar year until the funding operations and reductions of interest shall have come to an end, which will be Dec. 1, 1883, will be as follows:

	1878 and 1879.	1880-1882.	1883.	Thereafter.
Interest due on—				
Old mortgages (five issues).....	\$921,062	\$921,062	\$921,062	\$921,062
First consols and sterling convertible 6s.....	578,680	1,157,360	1,157,360	1,157,360
Funded coupons of above.....	243,043	243,045	243,045	243,045
Second consols and gold convertibles.....		1,500,000	1,500,000	1,500,000
Funded coupons of above.....	425,833	425,833	468,416	511,000
Total.....	\$2,168,630	\$4,247,300	\$4,289,883	\$4,332,467
Long Dock, etc., bonds.....	449,411	449,411	449,411	449,411
Rentals (about).....	742,226	742,226	742,226	742,226
Total fixed charges.....	\$3,360,267	\$5,438,937	\$5,481,520	\$5,524,104

The capital of funded coupons, and consequently the interest thereon, will be a little greater than given above, as it was found impossible to begin interest on them legally at the time set; but the amount is not yet determined—at least not announced—and the rentals vary from year to year somewhat. But the above will be substantially the fixed charges of the company for the several years named.

Option was also given to the stockholders to receive income bonds for assessments; but the interest on these will not be obligatory, that is, it will be due only if earned.

We see then that the company has to resume nearly full interest payments little more than a year from this time, and that though this year and next only

\$3,360,000 will be required for fixed charges, thereafter they will amount to \$5,400,000 and \$5,500,000 per year. The \$3,360,000 is something less than the net earnings of the road in the worst of recent years, but there have been but two years in the history of the road, those of the Watson administration, when the reported net earnings amounted to as much as the fixed charges as they will be in 1880 and afterward; and the English accountants who examined the books reported that in those years the net earnings were made to appear much larger than they actually were by charging what were properly expenses to other accounts. Since 1873 the net earnings have been:

1874.....	\$5,035,160	1876.....	\$3,621,259
1875.....	4,197,727	1877.....	3,809,950

The poorest of recent years produced enough to meet the obligations which accrue this year and next, but it appears that it is indispensable to the salvation of the reorganized company that, after 1879, the net earnings should be made greater than they ever have been before, and as much as 43 per cent. more than they were last year.

To effect this increase of profits the company will either have to increase its traffic or reduce its working expenses, or increase its rates. Increase of traffic to any very great extent in these days can only be had by taking it away from competitors and a large increase so obtained would probably result in smaller and not larger profits, as none of its rivals will suffer any great diversion of traffic without fighting for it; and some of them are in condition to stand a fight much longer than the New York, Lake Erie & Western can. The company will, however, soon be able to work for New England traffic much more effectively than heretofore. On the other hand, the passage of the control of the Michigan Central into the hands of Mr. Vanderbilt makes the Erie more dependent than before on its competitors for east-bound traffic. On the whole, we should say that it will be very creditable to the management if it succeeds in securing hereafter as large a share of the through traffic as it has had heretofore.

A reduction of expenses can hardly be expected without some improvements to the road, which indeed, as we have said, the reorganization scheme was expected to provide, by income diverted from interest payments to construction. But the income was so much smaller than was expected, after the reorganization scheme was adopted, that up to this time, when but fifteen years remain of the time during which partial payments are accepted, little could be taken from it for construction, and there remains only the \$3,300,000 which the assessments on the shares are expected to produce, and whatever surplus there may be from the profits of 1878 and 1879. Doubtless something can be done with this amount, whatever it may be, and indeed something has been done already. But so far the expenditures have not been to any great extent for improvements which will largely reduce working expenses. Such a result may be expected from the new powerful locomotives, but they, when the order has been fully completed, will not form an eighth of the company's stock. Transfer expenses and delays, which cost indirectly, will be saved by the completion of the standard gauge; but there will still remain a vast stock of broad-gauge cars which must be largely used for through freight and the track with three rails will be somewhat more expensive to maintain than one with two, other things being equal. The fact is, the plan of reorganization which was to provide new capital sufficient to provide those appliances most needed for working the road economically has failed to provide it. The road still lacks engine-houses, second tracks and sidings, yards and station appliances. A large part of its stock of locomotives is exposed to the weather when not running, and scores of them in winter must be kept under steam all the time to keep from freezing up.

Should the railroad companies succeed in maintaining through rates in both directions hereafter, the profits of the company will be materially increased; but probably not so much as many think.

No possible action and combination of the companies can make high through rates hereafter. West-bound rates have been almost perfectly maintained for more than a year past, but still rates have been decidedly low, and this season the canal has taken a considerable quantity of the kind of goods which for years before had gone almost wholly by rail. East-bound rates are governed to a very much greater extent by lake and canal competition, and, in spite of the greatest pressure of traffic that was ever known, the railroads this year since July have been compelled to accept rates materially lower than those which they readily obtained last year; and though if the railroads keep the peace they may easily make the business of the coming winter much more profitable than that of last winter, it now seems certain that they must accept low rates—perhaps lower than ever were agreed



upon heretofore for the winter, though of course not so low as they have sometimes of late years accepted on a large proportion of the winter's business.

Meanwhile there is the local traffic, which usually can be made fairly profitable; but this grows very gradually, and even with returning prosperity it will not grow very rapidly.

It is quite possible, or course, that the profits of this company by 1880 may be great enough to cover all the charges which will then be incurred; but still, this does not seem by any means so certain as it ought to have been made in reorganizing after a costly and tedious foreclosure. Improved business and great reductions in expenses ought not to be depended upon when the life of a great corporation is at stake; but the fixed charges should be so limited that matters would need to grow worse before failure to meet them could occur. It has been the curse of the Erie road ever since the "rescue" from the Gould and Fisk dynasty that its proprietors have had the most exaggerated ideas of its earning power. They seem to have been imposed upon by enormous increase of the nominal share capital from \$25,000,000 to \$86,500,000 between 1867 and 1871; while the funded debt itself, which will have increased by the time the reorganization scheme is perfected from \$26,400,000 (in 1872) to \$66,700,000, will not by any means wholly represent additions to the property. The truth is, the \$153,000,000 of stock and funded debt (not counting \$6,000,000 of Long Dock, etc., bonds which the company must pay interest on), which hereafter will form the capital of the New York, Lake Erie & Western Railroad Company (owning but 557 miles of road) is absurdly out of proportion to the value of the property—\$272,800 per mile of road, and \$127,500 per mile of track. The funded debt alone will be (by 1880) at the rate of \$119,600 per mile of road and \$55,500 per mile of track owned, while the New York Central, which has the most complete and costly appliances, separate freight tracks, complete shops and many millions of dollars' worth of warehouses and the like at one terminus—value enough in New York City, probably, to build a single track railroad from New York to Buffalo—has but \$175,356 of both stock and bonds per mile of road, and \$61,300 per mile of track; and the Pennsylvania Railroad, also recognized as one of the most perfect on the globe (aside from an investment of an equal amount in the securities of other companies), is represented by \$135,500 per mile of road and \$56,000 per mile of track. How it ever could be expected that the Erie should be able to do so much better than better roads, is astonishing; but it must if it is to return interest on all this enormously inflated capital, and it must do decidedly well in order to pay full interest on the funded debt which it will have when the period for funding coupons has expired. Average net profits of \$5,665 per mile of road worked will then be required to meet the interest and rentals, instead of the \$4,000 earned in the last year reported. To us it does not appear that the road has yet reached the perfectly stable position which should be held by this great trunk line—for such this extremely valuable, though by its owners much overvalued, railroad really is.

#### ERRORS OF NARROW-GAUGE REASONING.

On another page will be found a second letter from Mr. Ramsey, in which he reviews and analyzes the editorial comments on his first letter published last week. Apparently the only two real points of difference between us are the following:

1. He says: "The difference in the length of inner and outer rail is not the only reason for the difference in resistance; there is another reason, and that is, owing to the increased wheel-base of a 4 ft. 8½ in. truck as compared with the wheel-base of a 3 ft. truck, the angle at which the wheel flanges impinge against the rails is much greater on the broad than on the narrow gauge."

If this is so, why not put the wheels or axles as near together on the standard gauge as on the narrow? If the advantage gained thereby is of any importance, there is no reason why it should not be done. In fact, on the Baltimore & Ohio Railroad, twenty years ago, there were hundreds, probably thousands, of trucks running, the axles of which were very little if any more than three feet apart. This was also the case on other roads. To say that if the axles are placed further apart on standard-gauge trucks than on those for the narrow gauge the resistance will be increased, reminds us of the man who went to the doctor and told him that after eating lobster he always had the most horrible pain in his stomach. "Then," said the doctor, "what a fool you are to eat lobster." There is nothing to be said about placing the axles near together excepting that the dif-

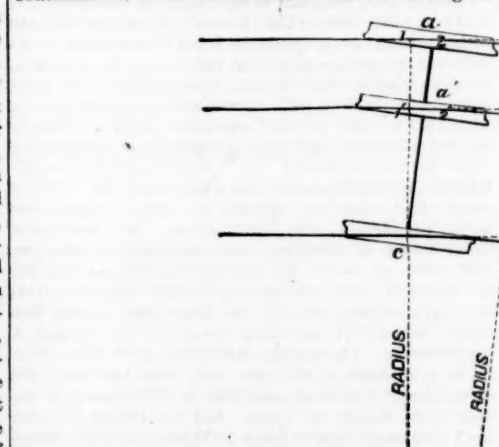
ficulties in the way of doing so are quite imaginary. They have been so placed and the cars run around curves much shorter than those in use on the Bells Gap Railroad and there is no difficulty in doing so.

2. Our correspondent says: "You claim that as the wheels on one side only slip, that for every ton of load, a load of only half a ton must slide a distance equal to the difference between the outer and inner rails. I claim that the resistance must be calculated on the whole ton, thereby doubling the figures given."

It took a good deal of time to make out from the letter of our correspondent how he came to this conclusion. He seems to have done so by first calculating the amount of longitudinal slip of the wheels for each foot in length of a 10 degree curve and of 4 ft. 8½ in. gauge, which is due to the difference in length of the inner and outer rails. Then he assumed "that the leading inside wheel cannot slip back a distance of one foot in rounding a curve without causing a corresponding diagonal and cross-slipping motion in wheels number 2 and 3." He thus calculated this diagonal or cross-slipping motion, and partly by accident, and with the help of little guess-work, he found that the average amount of diagonal slip of each of the four wheels was equal to twice the longitudinal slip of the two wheels on one side which is due to the difference in the length of the rails. From this he hastily concluded that as all the wheels slip the resistance must be calculated for the whole load on them and not for the half only, as was done in the calculations copied from the *Railroad Gazette* of Aug. 25, 1876.

In doing this he has confused two things together. There is, in the first place, a longitudinal slipping of the wheels on one side due to the difference of the length of the inner and outer rails, which is proportional to the gauge; and next there is a lateral slipping of the wheels due to the deflection of the curve from a straight line, which is independent of the gauge. The combination, or the resultant, of the two acting to-

gether forms what our correspondent calls the "diagonal" motion of the wheels. Thus let the engraving represent an inverted plan of a wide and narrow-gauge track, with a truck on it, which, we will imagine, is suited to run on either track. Now while the wheel *b* is running from 1 to 3, the wheel *a* is obliged to slip longitudinally a distance equal to 1, 2. The wheel *b* has also slipped longitudinally a distance equal to 1, 2 and transversely a distance 3, 4. The resultant or "diagonal" of these two motions is 3, 5. The slip of the wheel *d* is almost entirely transverse and is equal to 6, 7; that of *c* is a twisting motion with perhaps a slight transverse movement due to the action of the flange. The motion of each wheel may be regarded as the resultant of the longitudinal and transverse slip. It will be noticed too that if we regard the wheels *a', b', c, d* as forming a narrow-gauge truck, the longitudinal slip 1' 2' is considerably less than 1, 2, the two being proportional to the gauge, whereas the transverse slip 4, 3 of the wide and 4' 3' of the narrow-gauge are the same, or are independent of the gauge. As we have said before, the "diagonal" slip is the resultant of the longitudinal and transverse slip, and therefore represents the whole of the two combined. As the transverse slip is the same in all gauges, in making comparisons it may be disregarded, and only that portion of the resistance need be taken into account which is affected by the gauge.



If our correspondent had also calculated the diagonal slip of a narrow-gauge truck, as well as that of one for a wide gauge, he would have discerned his error, and found that there was as close an agreement in his method of calculation and ours as could be expected when one of his factors, the slipping of his fourth wheel, was only a rough approximation, and was not the result of calculation. Thus, with a 10-degree curve, he gives the diagonal slip at 0.00715 ft. for each wheel, and adds 0.00106 because the fourth

one is "twisted." By calculating the diagonal slip for a 3 ft. gauge truck with the same spread as the one for the wide gauge or 4 ft. 11 in., we have 0.00588 as the diagonal slip. Adding the twisting element to each, and we have 0.00821 for the diagonal slip on the wide gauge, and 0.00694 as the slip on the narrow gauge, and

$0.00821 \times 400 = 3.28 = \text{slipping resistance per ton on wide gauge.}$

$0.00694 \times 400 = 2.77 = \text{slipping resistance per ton on narrow gauge.}$

$0.51 \text{ lbs.} = \text{difference.}$

By the method of calculation given in the *Railroad Gazette* we would have:

$$\frac{10.74 \times 200}{3,600} = 0.59 \text{ lbs. difference.}$$

Instead of showing an error in our method of calculation, our critic has only confirmed its correctness. Those who read his letter carefully will observe that he did not use his own method of calculation to determine the difference in the resistance on the two gauges, but he applied it to a wide-gauge truck, then drew a wrong deduction, and applied that deduction to our method of calculation.

Our correspondent says truly that "the difference in the length of the inner and outer rail is not the only reason for the difference in resistance." Certainly it is not: the lateral slip and the flange friction, especially the latter, are important elements. Mr. Whinery, in his paper, estimates them at 57 per cent. of the curve resistance. Now, taking the method of calculation which our correspondent employs, we would have as the resistance due to the difference between the length of the inner and outer rails on a 19-degree curve of standard gauge:

$$\frac{29.58 \times 400}{1,884.06} = 6.3 \text{ lbs.}$$

But the total curve resistance is only  $19 \times 0.5 = 9.5$  lbs., so that there would be only 3.2 lbs. for the flange resistance and lateral sliding. On the Metropolitan

Elevated Railway experiments were made with wheels fastened in the ordinary way on the axles, and with others loose, so that they could revolve independently of each other. With the latter there was, of course, no longitudinal sliding. The difference was less than 0.1 lb. per degree, whereas the preceding calculation would give 0.33 lb. per degree, or more than three times as much.

Our correspondent has also made another singular inference in assuming that because the resistance due to the longitudinal slipping of the wheels is the same on a 29.83-degree curve on a narrow gauge that it is on one of 19 degrees on a standard gauge, therefore, the former curve can be used on a 3 ft. gauge in places where the latter must be employed if the gauge is 4 ft. 8½ in. Now even if curves which offer equal resistance must be used for the two gauges—which is not true—the total resistance must be taken, and not one element in it only. In order to make it quite plain that this total resistance is not "much greater," the accompanying table has been calculated, showing the resistance on different curves and grades for the two gauges, and the difference is given in the percentage of the resistance on the standard gauge.

It will be seen from this table what the difference is. It varies from 8.9 per cent. on a level curve of 100 ft. radius to 0.4 per cent. on a curve of 600 ft. radius on a grade of 250 ft. per mile. On curves of 200 ft. radius and grades of 150 ft. per mile, which we infer from Mr. Ramsey's letter are the maximum curves and grades on his line, the resistance would be 2.1 per cent. greater if the road was 4 ft. 8½ in. instead of 3 ft. gauge. In that event the train loads must be reduced in somewhat the same proportion, and the train expenses will of course be increased; but this will be more fully discussed when we consider the cost of operating expenses.

What we contend for is, that the resistance on the



Table Showing the Resistance on Standard and Narrow-Gauge Railroads.

	Curve of 100 ft. radius.		Curve of 150 ft. radius.		Curve of 200 ft. radius.		Curve of 250 ft. radius.		Curve of 300 ft. radius.		Curve of 400 ft. radius.		Curve of 500 ft. radius.		Curve of 600 ft. radius.									
Difference in resistance in lbs. per ton between a standard and a 3-ft. gauge. . . . .	3.4.		2.3.		1.7.		1.3.		1.1.		0.8.		0.6.		0.5.									
Grade: Rise in feet per mile.	Resistance on standard gauge. . . . .	Resistance on narrow gauge	Difference in per cent. of the resistance on the standard gauge	Resistance on standard gauge	Resistance on narrow gauge	Difference in per cent. of the resistance on the standard gauge	Resistance on standard gauge	Resistance on narrow gauge	Difference in per cent. of the resistance on the standard gauge	Resistance on standard gauge	Resistance on narrow gauge	Difference in per cent. of the resistance on the standard gauge	Resistance on standard gauge	Resistance on narrow gauge	Difference in per cent. of the resistance on the standard gauge	Resistance on standard gauge	Resistance on narrow gauge	Difference in per cent. of the resistance on the standard gauge						
0	38.0	34.6	8.9	27.5	25.2	8.3	22.5	20.8	7.5	19.5	18.2	6.6	17.5	16.4	6.3	15.2	14.4	5.2	13.7	13.1	4.3	12.7	12.2	4.0
10	41.7	38.3	8.1	31.2	28.0	7.4	26.2	24.5	6.5	23.2	21.9	5.6	21.2	20.1	5.2	18.9	18.1	4.2	17.4	16.8	3.4	16.4	15.9	3.0
20	45.5	42.1	7.5	35.0	32.7	6.6	30.0	28.3	5.6	27.0	25.7	4.8	25.0	23.9	4.4	22.7	21.9	3.5	21.2	20.6	2.8	20.2	19.7	2.4
30	49.3	45.9	6.9	38.8	36.5	6.0	33.8	32.1	5.0	30.8	29.5	4.2	28.8	27.7	3.8	26.5	25.7	3.0	25.0	24.4	2.4	24.0	23.5	2.1
40	53.1	49.7	6.4	42.6	40.3	5.4	37.6	35.9	4.5	34.6	33.3	3.7	32.6	31.5	3.3	30.3	29.5	2.6	28.8	28.2	2.0	27.8	27.3	1.8
50	56.9	53.5	5.9	46.4	44.1	5.0	41.4	39.7	4.1	38.4	37.1	3.3	36.4	35.3	3.0	34.1	33.3	2.3	32.6	32.0	1.8	31.6	31.1	1.6
60	60.7	57.3	5.6	50.2	47.9	4.5	45.2	43.5	3.7	42.2	40.9	3.0	40.2	39.1	2.7	37.9	37.1	2.1	36.4	35.8	1.6	35.4	34.9	1.4
70	64.5	61.1	5.3	54.0	51.7	4.1	49.0	47.3	3.5	46.0	44.7	2.8	44.0	42.9	2.5	41.7	40.9	1.9	40.2	39.6	1.4	39.2	38.7	1.3
80	68.3	64.9	4.9	57.8	55.5	3.9	52.8	51.1	3.2	49.8	48.5	2.6	47.8	46.7	2.3	45.5	44.7	1.7	44.0	43.4	1.3	43.0	42.5	1.1
90	72.0	68.6	4.7	61.5	59.2	3.7	56.5	54.8	3.0	53.5	52.2	2.4	51.5	50.4	2.1	49.2	48.4	1.6	47.7	47.1	1.2	46.7	46.2	1.0
100	75.8	72.4	4.5	65.3	63.0	3.5	60.3	58.6	2.8	57.3	56.0	2.3	55.3	54.2	2.0	53.0	52.2	1.5	51.5	50.9	1.1	50.5	50.0	0.9
150	94.8	91.4	3.6	84.3	82.0	2.7	79.3	77.6	2.2	76.3	75.2	1.7	73.3	72.2	1.4	70.3	69.5	1.1	68.4	67.6	0.8	66.5	65.7	0.7
200	113.7	110.3	2.9	103.2	100.9	2.2	98.2	96.5	1.7	93.2	91.9	1.3	88.2	87.1	1.2	86.0	85.2	0.8	84.5	83.9	0.6	83.4	82.9	0.5
250	132.6	129.2	2.5	122.1	119.8	1.8	117.1	115.4	1.5	112.1	110.8	1.1	112.1	111.0	0.9	109.8	109.0	0.7	108.3	107.7	0.5	107.3	106.8	0.4

standard gauge is not "much greater" than on the narrow gauge. In fact, the whole of this discussion turns upon the word *much*. That there is a difference in resistance on narrow and broad-gauge roads is freely admitted, but that it is sufficiently great to materially affect the cost of construction or operation of railroads is denied; and that narrow-gauge roads of the same character, giving the same facilities to business and which are at all comparable "can be built for from one-half to two-thirds the cost of a broad gauge, and can be operated at two-thirds the cost," is regarded as one of the most remarkable delusions of modern times.

There is, however, danger that this discussion may assume the character of purely theoretical speculation. In order to avoid this, we will endeavor to discuss hereafter the two practical questions—first, How much more would the Bell's Gap or any other narrow-gauge railroad, have cost if it had been built of the standard gauge; and, second, How much would the operating expenses have been increased thereby. Those are the real questions at issue, and in which the public are interested. In doing this, if Mr. Ramsey could give a detailed statement of the total cost of his road—and by the total cost is meant the entire amount of money expended on it—he would be furnishing a very valuable contribution to the discussion of the question of the gauges. In estimating the operating expenses it would also be desirable to know the grades and curves of the road, especially the sharpest curves and steepest grades which occur together, and which govern the train-loads. We will then try to make clear the questions of cost of operating.

One more remark about curves. The list of sharp curves on standard-gauge roads was not intended to be complete, whereas that of those on the narrow gauge was, although there are some omissions. The sharp curves of the standard gauge were cited simply from such data as were at hand, as examples to show that such curves could be operated, and of course if it can be done in one case it can be done in others, which has heretofore been denied by the narrow-gauge advocates.

If curves of 90 and 100 ft. radius can be used on roads with an enormous traffic like that on the two elevated lines in New York, there certainly can be no difficulty in operating curves of more than twice that length of radius with the same gauge.

It is true that some axles with loose wheels are used on the elevated roads, but a much larger number of wheels and axles of the ordinary kind are running. To say that you can't operate as sharp curves on a 4 ft. 8½ in. as on a 3 ft. gauge road is now like the remark of the man who was put in jail for committing some infraction of law, and whose lawyer told him, "You can't put a man in jail for that;" "but I am in jail," his client answered. Curves as sharp as those used on the narrow gauge are and can be used with the standard gauge, and the fact cannot be denied even by a "large majority."

#### Traffic of Northwestern Wheat Roads.

The traffic of the railroads west of Lake Michigan, or in the district where spring wheat is chiefly grown, which includes the agricultural parts of Wisconsin and Minnesota and Northern Iowa, to a line a little south of the latitude of Dubuque, seems likely to be on the whole decidedly light this year. This was to be expected, by reason of the great injury to the wheat crops in this territory, and the reports of earnings since harvest support this expectation. The railroads chiefly affected, with the exception of some comparatively short ones in Iowa and Minnesota, have made returns for September, and all show large decreases, and those whose lines are almost wholly in this district very large ones indeed—from 28½ to 42½ per cent., and the aggregate

earnings of the four companies reporting is 26½ per cent. less this year than last, though they have a somewhat larger mileage. But though the traffic this year has been decidedly unfavorable, it is not so much so as is made to appear by a comparison with last year's; for last year the traffic and earnings were exceptionally great, the crops being the largest or nearly the largest ever known and going forward very early and rapidly. We will understand this better if we compare the September earnings of the roads in question for the past five years, which we do below:

	1878.	1877.	1876.	1875.	1874.
Bur. C. R.	\$138,807	\$194,226	\$90,800	\$117,928	\$126,295
Chic. & N. W.	1,345,796	1,539,368	1,182,830	1,206,806	1,254,255
Chi., Mil. & St. Paul.	677,000	1,179,000	645,831	741,206	798,859
Iowa Lines of Ill. Cen.	129,931	209,639	127,698	158,963	170,947
Total	\$2,291,624	\$3,142,233	\$2,047,159	\$2,224,903	\$2,350,356

Probably more than half of the Chicago & Northwestern's road (the 1,502 miles which it owns or works directly and whose earnings are given above) is but little affected by the failure of the spring-wheat crop; but most of the mileage of the other roads is so very largely, as is indicated by the great increase for 1876 to 1877, as well as by the great decrease from 1877 to 1878; for 1876 was also a year when Wisconsin and Minnesota had much less than the usual amount of wheat to send to market. But if these figures show unmistakably that last September was a bad month for traffic, it shows also that its badness is vastly exaggerated by a comparison with 1877 alone. The Burlington, Cedar Rapids & Northern, which seems to have done very badly when we see that the earnings were 28½ per cent. less this September than last, looks much better when we see that this year's earnings, after all, are larger than in any September before 1877, and this is true also of the Chicago & Northwestern. The Chicago, Milwaukee & St. Paul, which shows a decrease of 42½ per cent. from last year, still earned nearly 5 per cent. more than in 1876—that is, it has done worse, though not often. And the Illinois Central's Iowa lines earned a little less in 1876 than this year, though so very much more in 1877. Taking the four companies together, which have this year about 3,800 miles of road, though their aggregate earnings this year are as much as 27 per cent. less than in September, 1877, they are 12 per cent. more than in 1876, 3 per cent. more than in 1875, and only about 2 per cent. less than in 1874. The condition of things is not unexampled by any means, and, indeed, we have only to look behind the last year to see something which closely resembles it, but which to every one of the roads reporting was a little worse.

#### Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

*Denver, South Park & Pacific*.—Extended from Pine Grove, Col., southwest to Bailey, 11 miles. The road must also be credited with 9 miles additional, as the extension built this year is not from the old terminus at Morrison, as previously reported, but from Black Creek Junction, nine miles from Morrison. It is of 3 ft. gauge.

*Cincinnati, Rockport & Southwestern*.—Extended from Ferdinand, Ind., north to Henryville, 2 miles.

*South & North Alabama*.—The *W. Tumpka Branch* is completed from Elmore, Ala., east to Wetumpka, 7 miles. It is of 5 ft. gauge.

*Elberton Air Line*.—Extended east by south to Royston, Ga., 24 miles. It is of 3 ft. gauge.

This is a total of 53 miles of new railroad, making 1,320 miles completed in the United States in 1878, against 1,505 miles reported for the corresponding period in 1877, 1,719 in 1876, 861 in 1875, 1,125 in 1874, 2,867 in 1873, and 5,066 in 1872.

FRENCH FREIGHT RATES are complained of by Mr. Charles Baum, an eminent railroad officer and engineer, as too low, and tending lower, so that now they barely cover, on the average, the expenditures for working and interest, and are likely soon not to suffice for that. In the year 1874 the average receipt per ton per mile was 1.663 cents, but the expenditures (including interest) were only 0.0057 cent less—that is, the margin over expenditures was less than three-eighths of one per cent. In France the railroads are

divided into an "old system" and a "new system," each of the six great companies owning some lines of both systems. In 1874 there were about 5,600 miles of the old system and 5,000 of the new. The receipt per ton per mile was about the same on the old as on the new system, but the expenditures (including interest) were 1.365 cents on the old and 2.693 cents on the latter. On the new system the expenditures were 60 per cent. greater than the earnings. This is due to the irrational system of requiring substantially as low rates on roads with thin traffic, and consequently costing more per ton and per passenger per mile both for interest and working expenses, as on the roads with the heaviest traffic. The losses on these roads are made up partly by the government subsidies and partly by the profits of the "old system." Thus those who do not have occasion to use the lines of the "new system" are taxed to pay for transportation for those who do. A similar system was contemplated by some of the granger laws, which established the same rates per mile on all the lines of any one company's system, including main lines which had earned a profit of thousands of dollars per mile at low rates, and branches which at much higher rates had never earned their expenses.

The working expenses alone on the French "new system" were in 1874 1.128 cents per ton per mile, it being the interest charges which brought up the total expenditure to 2.693 cents. In that year, when the average receipt was 1.662 cents in France, it was 1.4476 cents in New York. In 1877 in the latter state it had fallen to 1.059 cents, and meanwhile we may be sure that there was no such decrease in France. Indeed, there was a little increase from 1872 to 1874, and a decrease of 30 per cent. from 1860 to 1874 on one of the French roads and of 22½ per cent. from 1856 to 1872 on another are spoken of as something remarkable. The decrease in New York from 1860 to 1874 was 32 per cent., and from 1874 to 1877 it has been 27 per cent. This latter resembles a revolution in rates that took place in Bavaria, where the average receipt per ton per mile fell from 2.767 cents in 1868 to 1.855 in 1872, or 33 per cent. in four years. It is to be remarked, however, that after the fall the rate remained at what now appears to most American roads of considerable traffic like a very satisfactory amount.

THE INFLUENCE OF THE ELEVATED RAILROADS ON THE STREET RAILROADS can only be measured when we have reports of the doings of the latter, which will not be for a year yet, probably. But the Sixth Avenue street company which is most of its length on the same route as the Metropolitan Elevated, has given reports of its earnings for three months since the Metropolitan was opened, for this year and last, and they compare as follows:

	1878.	1877.	Decrease.	P. c.
June	\$65,209	\$73,191	\$7,982	10.9
July	51,808	59,251	7,384	12.5
August	47,921	53,958	6,037	16.0
	\$164,938	\$186,401	\$24,303	12.9

Those who are familiar with the business of the two roads only by observation will certainly be surprised to see that the decrease has been so small. It represents only a falling off of 486,060 passengers in the three months, or 5,283 per day, which is only about one tenth of what the Metropolitan road's traffic is reported to be. That the elevated road has drawn only one tenth of its traffic from the street railroad directly under it seems almost incredible, though there is no doubt that the Broadway and Seventh avenue roads have suffered almost as much as the Sixth avenue by the competition of the new steam line, and that a great many passengers have been drawn also from the Broadway stages, the Eighth avenue road, and the old Ninth avenue elevated road, besides some from the east side lines. But all this will not account for the Metropolitan's traffic if the Sixth avenue road has lost but 5,300 passengers per day. In 1875-76 that road had an average of 48,423 passengers per day, including Sundays, or about as many as the Metropolitan is reported to have now. (No official statement has been made by the latter, but some of its officers have said that it had "about" or "more than" 50,000 passengers per day.)

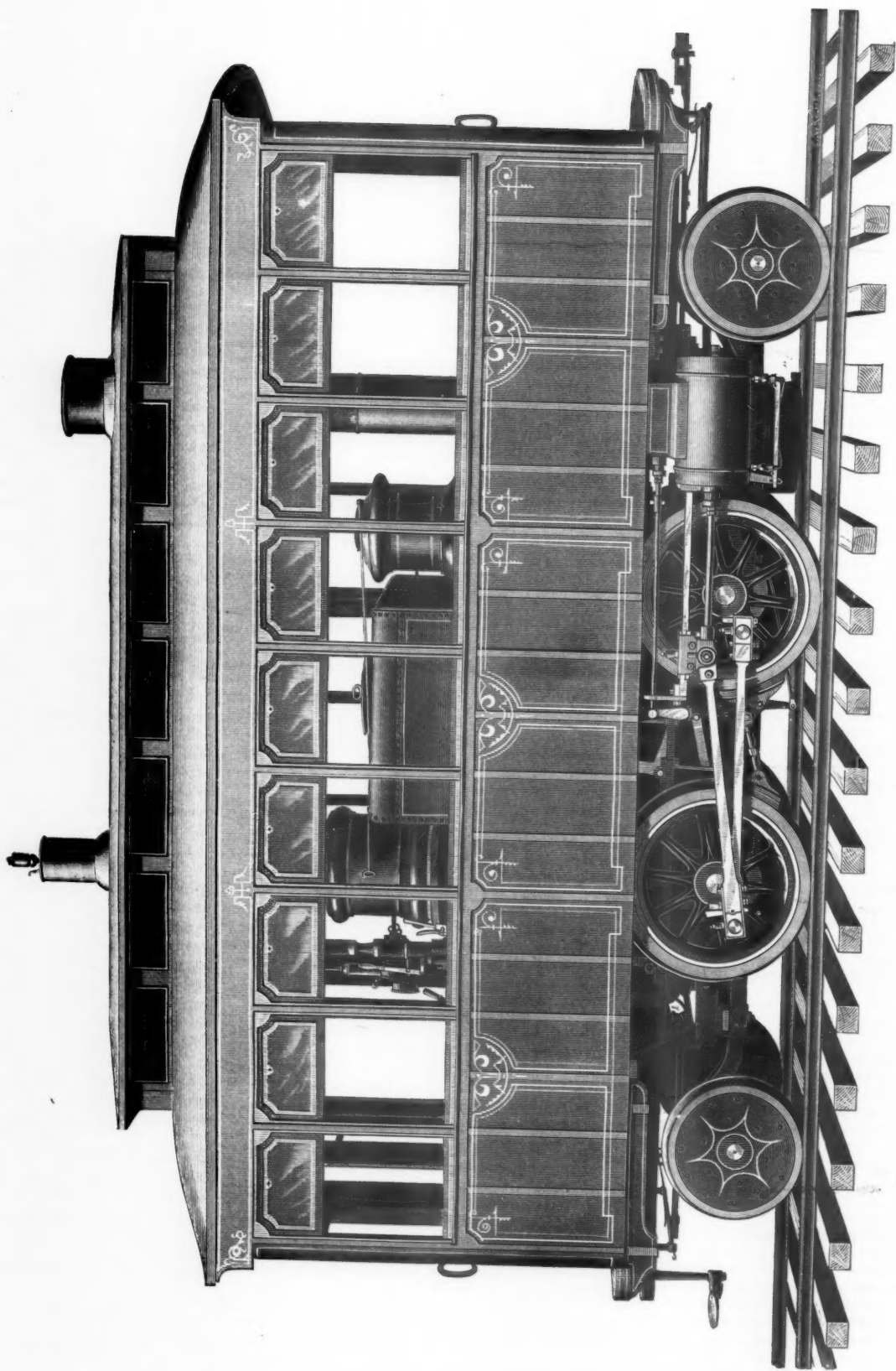
It will be noticed, however, that the decrease is least in the first and greatest in the last month reported. In the latter, the decrease represented a loss of 178,740 passengers, or 5,766 per day; and as the Metropolitan does not yet run



PROCEEDINGS OF THE







LOCOMOTIVE FOR THE METROPOLITAN ELEVATED RAILWAY,

*By the Grant Locomotive Works, Paterson, N. J.*

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trains on Sunday, we may count the daily decrease for the three months as 6,153, and for August, 6,620—about one-eighth of what is intimated to be the total traffic of the Metropolitan.

THE INTERIOR THROUGH GRAIN MOVEMENT, consisting of shipments from the farmers' stations directly through either to the exporting cities or to the interior Eastern towns where it is consumed, long ago became an important business; but it is one about which it is especially difficult to get definite information. There is nowhere any report of the shipments of interior Western stations, and nowhere any of the receipts of interior Eastern stations. We have had to content ourselves with the impression of railroad men that it has become "a big business," and with the confession of grain merchants at the great seaboard cities that the business of distribution from these points for domestic consumption in the interior has been to a great degree destroyed. There is, however, one way by which we may get some clue, if not to the bulk, at least to the increase or decrease of this interior movement, and that is by comparing the aggregate shipments made from Northwestern markets, which are great secondary receiving markets, with the aggregate receipts of the Atlantic ports.

The excess of Atlantic receipts over Northwestern shipments for the past ten months of this year has been about fifty million bushels, while last year it was but six millions and the year before eight millions, and that before Northwestern shipments exceeded Atlantic receipts. This indicates partly larger exports, but also and chiefly a larger proportion of grain shipped from interior points of the West directly to the seaboard, or so as not to pass through any of the eight Northwestern markets that report, which are St. Louis, Peoria, Chicago, Milwaukee, Duluth, Detroit, Toledo and Cleveland. This difference, however, does not begin to measure the amount of these interior shipments, as a very large part of the latter, and certainly a considerable part of what is reported under "Northwestern shipments," goes directly to Eastern interior points to be consumed, and so does not appear at any time among Atlantic receipts. But the reports show that this year if all the grain shipped from the eight Northwestern markets had been sent to the seven Atlantic ports, it would not have sufficed, by 50,000,000 bushels, to make up the total receipts of the Atlantic ports. To find the total movement from interior and Eastern points, chiefly from stations west of Pennsylvania near the farms where the grain is produced, we would need to add the total receipts in the interior towns of the East to the fifty millions of excess of seaboard receipts over Northwestern shipments. The East has a population of more than twelve millions to supply, but more than a quarter of it is in these very Atlantic ports, and part of the rest, is supplied with grain from them, and the East also partly supplies itself; but there must be a direct importation of many millions of bushels to interior Eastern points. This is a traffic, however, which does not now largely increase, as the interior has long been largely or chiefly supplied in that way; thus the increase in the direct shipments from interior Western stations must be pretty nearly the same as the increase in the excess of Atlantic receipts over Northwestern shipments. This is especially interesting to the railroads, as they necessarily do all this business. The grain cannot go to a lake port without being reported. The great increase this year was made largely last winter, when the railroads carried much more grain than ever before at that season, but it has continued ever since, and has been large since harvest, as the winter wheat of Southern Illinois, Indiana, and Ohio, which has given a large part of the business this year, cannot be forwarded by lake and canal without making a great detour.

THE ST. LOUIS, IRON MOUNTAIN & SOUTHERN CASE, a telegraphic report of the decision in which was published last week, seemed very strange. But the report was not so clear as it might have been, and it seems that the decision of Judge Dillon, which prevails, is that the parties suing for a foreclosure are entitled to a decree, not for the principal of the bonds, which the Judge says is not in this case made due by the failure to pay the coupons, but for the amount of interest in arrear on the consolidated mortgage bonds. The dissent of Judge Treat was as to complainants' right to include the default of April, 1877, which, apparently, he held to have been provided for by the agreement between the company and the bondholders. On this account he held that the bill should be dismissed. The judges concurred that there had been no agreement to accept less than full interest, which the company claimed to have been the case. As Judge Dillon is the Circuit Judge, and Judge Treat the District Judge, the opinion of the former prevails, and the complainant will be entitled to a decree of foreclosure where the Master has reported the amount of overdue interest; but there will doubtless be further delay by an appeal.

As the decree is only for the amount of overdue interest, the amount required to satisfy the judgment will be comparatively small, and the sale, if the foreclosure is finally effected, will doubtless have to be made subject to the consolidated mortgage. Usually railroad mortgages specify that if the company fail to pay any one coupon, by that failure the whole principal becomes due immediately.

THE DECREASE IN THE GRAIN MOVEMENT continues and is very marked, and has come at a time when usually the movement is increasing. Northwestern receipts, as we noted last week, have decreased constantly since August, and were nearly 4,000,000 bushels less in the last week of September than in the last week of August, and the decrease in Northwestern shipments and Atlantic receipts, though less proportionally,

is still very large. But it should be kept in mind that the movement is not now small, in spite of the great decrease. On the other hand it is decidedly large, and these Northwestern receipts for the last week reported, so small in comparison with those of several previous weeks, were exceeded but four weeks after harvest in 1873, never in 1874, but one week in 1875, four weeks in 1876, and in seven weeks last year. And with regard to Northwestern shipments and Atlantic receipts, the comparison with previous years is still more favorable. The present movement, though very much lighter than that of a few weeks ago, is still what cannot properly be termed anything other than a heavy movement. It is true, however, that the decrease, if it continues, will probably make it impossible to advance rates, and may make it difficult to maintain them.

THE SOUTHERN PACIFIC is said to have begun work on an extension of its road from its present terminus at Fort Yuma eastward, with the intention of completing it rapidly to Tucson, from 275 to 300 miles. Tucson is about 800 miles distant from the present terminus of the Atchison, Topeka & Santa Fe, which is being pushed forward with great rapidity. It appears as if, while the Northern Pacific and the Texas & Pacific are waiting, a new route to the Pacific may be completed by the meeting of these two roads. It will be entirely distinct from the old route, unless with the exception of a few miles at the San Francisco end, but the Southern Pacific being owned by the chief proprietors of the Central Pacific, we may take it for granted that pains will be taken not to injure the business of the latter road. But the Union Pacific might suffer seriously by the opening of this route, which would be considerably longer than the present one, but not so much so as to prevent its competing seriously and effectively for both passenger and freight traffic.

SEPTEMBER EARNINGS we find reported already by 18 railroads—an unusual number to report so early in the month. Ten of these show larger receipts than last year, and some of the increases are very great—as the Atchison, Topeka & Santa Fe, the Denver & Rio Grande and the Central Pacific. On the other hand, there are some great decreases, as 42½ per cent. on the Chicago, Milwaukee & St. Paul, 38 per cent. on the Iowa lines of the Illinois Central and 28½ per cent. on the Burlington, Cedar Rapids & Northern. Altogether the decreases exceed somewhat in amount the increases. All the roads reporting are in the West—all but the Wabash west of the meridian of Chicago, while the whole of 10 of them and parts of four others are west of the Mississippi—only four being wholly east of it.

WATER RATES have advanced a little during the week ending with Tuesday. The changes in lake rates were slight, but the quotations of 3½ cents for wheat and 3½ for corn made for a single day of the previous week (Tuesday) seem not to have lasted long; but the recovery was not more than a quarter of a cent.

Canal rates for two or three days have been quoted about a quarter of a cent. higher than last week, closing Tuesday at 8¼ to 8½ cents per bushel for wheat from Buffalo to Chicago, 7½ for corn, and 5½ for oats; rail rates meanwhile remaining at 8½, 8 and 5.

Ocean rates are very little changed, 6d. per bushel being now the commonest quotation for grain by steam to Liverpool.

THE EAST-BOUND POOL was to be considered at a Meeting in Chicago on Thursday of this week, after we go to press. We have not heard that any further progress has been made toward preparing for it by agreeing upon divisions at different places. In St. Louis the companies have taken the bull by the horns, and consolidated their agencies, so that one man has charge of the making of all contracts for shipments to the East, and the knives having been thrown away, it is hard to see how cutting can be resorted to. If this policy should be generally adopted, there would be an army of men—many of them very able and skillful men—thrown out of employment, but if the railroads can keep the peace, they had better give them permanent leave at double wages than to keep them at work.

SWISS RAILROADS, like many nearer home, have been having a hard time. That country has had an epidemic of construction, and as the ground is difficult and the population and production not heavy and not very progressive, the natural consequence has been unsatisfactory returns on the capital invested. The current market value of the securities of 18 companies, representing about \$215,000,000 of capital actually expended, is but \$115,000,000. Their gross earnings in 1876 were at the rate of \$8,250 per mile, which is much more than the average in this country (about \$6,015 in gold). But the cost of the Swiss roads was about \$214,000 per mile, against \$61,000 for the American.

#### Locomotive for the Metropolitan Elevated Railway.

With the *Railroad Gazette* of this week is published a full-page engraving of the locomotives used on the Metropolitan Elevated Railway. The dimensions of these engines are as follows:

Cylinders 10 in. in diameter × 16 in. stroke.  
Driving-wheels, 39 in. diameter.  
Truck-wheels, 28 in. diameter.  
Total wheel-base, 15 ft. 6 in.  
Boiler made of steel.  
125 flues 1½ diameter × 70 in. long.  
Fire-box, 42 in. long × 27 in. wide.  
Axles 4½ in. diameter.  
Capacity of tank, 320 gallons.

Weight of engine loaded, 32,500 lbs.

Weight on driving-wheels, 27,500 lbs.

These engines have now been working for several months and have done good service. They pass around curves of 90 ft. radius, and the heaviest trains consist of three loaded cars. The engines last ordered have, however, larger boilers, and the cab is made shorter, so as to expose the water tank and part of the boiler to view.

## General Railroad News.

### MEETINGS AND ANNOUNCEMENTS.

#### Railroad Conventions.

The *Southern Time Convention* will hold its fall session at the Windsor Hotel, New York City, Oct. 17.

The annual convention of the *Brotherhood of Locomotive Engineers* will be held in Indianapolis, beginning Oct. 16.

The *Narrow-Gauge Convention* will meet, pursuant to adjournment, in Cincinnati, Oct. 23.

The annual convention of the *Railroad Claim Agents' Association* will be held at the Planters' Hotel, St. Louis, Dec. 4, having been postponed to that date from Oct. 15.

#### Foreclosure Sales.

The sale of the *Montclair & Greenwood Lake* road was completed in Jersey City, N. J., Oct. 5, the Purchasing Committee appearing and taking the road at \$156,000, the price at which the bidding closed when the sale was adjourned Sept. 28. Col. Benson, who then bid against the committee, did not appear, and it is understood that he has since come to terms with the other bondholders. About \$35,000 of the purchase money will have to be paid in cash, to meet costs, Receiver's debts, etc. The road is 40 miles long, from West End Junction, N. J., to Hewitt, and had a bonded debt of \$700,000 first and \$1,800,000 second-mortgage bonds. It has been in trouble ever since it was built, this being its fourth sale. It has recently received attention out of all proportion to its real importance, on account of the troubles among its bondholders. It is reported that Mr. Benson has sold his bonds to Mr. Abram S. Hewitt; also that Mr. Hewitt has bought up other bonds, and will hold a controlling interest in the new company.

The sale of the *Paris & Danville* road has again been postponed from Oct. 2 to Oct. 23, by order of the United States Circuit Court.

The *Bridgeton & Port Norris* road will be sold at Bridgeton, N. J., Nov. 30, under a decree of foreclosure granted by the New Jersey Court of Chancery at suit of the Fidelity Insurance, Trust & Safe Deposit Company, of Philadelphia, Trustee. The road is 20½ miles long, from Bridgeton, N. J., to Bay Side View, and has a bonded debt of \$400,000. It has been in the hands of a receiver four years, and has barely earned its running expenses, showing a deficit in some years.

#### Conductors' Brotherhood.

The annual session of the Grand Division began in Chicago, Oct. 2, delegates being present from nearly all the divisions. The opening proceedings were public, and the annual address was delivered by Grand Chief Conductor W. L. Collins, who reviewed briefly the progress of the order during the year and its present condition. He referred to the injurious effects of last year's strikes upon railroad men. He stated that the order had made substantial progress during the year.

The private sessions were expected to continue about a week. It is understood that the constitution was to be revised and amended.

On Oct. 4 an open session was held at which several addresses were made by officers of the association and invited guests. On behalf of the members emphatic statement was made of their opposition to all strikes, and it was announced that, to prevent the founding of the organization with other "brotherhoods," it had been decided to change the name to "The Order of Railway Conductors." At the close of the regular session a short time was spent in social conversation, which was much enjoyed.

In the private session a resolution was adopted favoring the establishment of a home for disabled or superannuated conductors.

#### Brotherhood of Locomotive Engineers.

The *Journal* of the Brotherhood gives the following notice of the approaching annual meeting: "Our convention will be convened in Masonic Hall at Indianapolis, Ind., on Wednesday, Oct. 16, at 10 o'clock, a. m., sharp, and we trust every delegate will be on time."

"The opening services will be public, and it is desired that a goodly number attend. The Lieutenant Governor of the State and the Mayor of the city are to be present, and will address the delegates, to which suitable replies will be made; so that, without question, a pleasant and profitable time may be expected."

"Arrangements have been made for all of the delegates to stop at the Grand Hotel. Blank reports and credentials have been forwarded to each division. If any have failed to receive them, we trust that they will notify us of the fact at once, that we may send them again."

### ELECTIONS AND APPOINTMENTS.

*Baltimore & Ohio.*—The following circular is dated Sept. 28: "Mr. Samuel Powell has been appointed Assistant General Ticket and Passenger Agent of this company for the Northwest, to take effect Oct. 1, his residence being at Chicago."

Mr. Powell is well known from his long connection with the Chicago, Burlington & Quincy.

*Charlotte, Columbia & Augusta.*—The officers of this road are now as follows: General Superintendent, T. M. R. Talcott, Richmond, Va.; Superintendent, T. D. Kline, Columbia, S. C.; Treasurer, John C. B. Smith, Columbia, S. C.; General Freight Agent, Sol. Haas, Richmond, Va.; General Passenger Agent, John R. Macmurdo, Richmond, Va. Messrs. Talcott, Haas and Macmurdo are new appointments; they are also officers of the Richmond & Danville, which now controls this road.

*Chicago, Burlington & Quincy.*—Mr. W. R. Crumpton has been appointed General Agent, with headquarters at Quincy, Ill. He will perform the duties heretofore devolving upon the Division Freight and Passenger Agent.

Mr. John Shea, late of the Keokuk & Des Moines, is appointed Division Roadmaster of the Burlington Division of this road.

*Denver & Rio Grande.*—A Denver (Col.) dispatch reports that Mr. D. C. Dodge has been appointed General Superintendent. Mr. Dodge has been for some time General Freight and Passenger Agent.

*Duck River Valley.*—At the annual meeting in Columbia, Tenn., Sept. 24, the following directors were chosen: A. D.



Bryant, F. J. Ewing, J. H. Lewis, R. G. McClure, R. S. Montgomery, T. D. Moore, J. T. Street, H. B. Tally, E. Williams. The board elected J. H. Lewis President; Geo. Childress, Secretary, Treasurer and Superintendent.

**Grand Haven.**—Manager May announces the following appointments: E. C. Leavenworth, General Freight Agent and Master of Transportation; Hugo Haebringer, Auditor; A. D. Nelson, Master of Track and Bridges; Henry Bettinghouse, Master Mechanic. The offices are all at Allegan, Mich., except that of the Master Mechanic, which is at Muskegon.

**Hannibal & St. Joseph.**—Mr. W. R. Woodard has been appointed General Superintendent, to date from Oct. 1. Mr. Woodard has been Superintendent of Telegraph and Superintendent of the Hannibal Division for a long time.

**Lake Apopka & Clay Springs.**—The officers of this new Florida company are: George Wadsworth, President and Engineer; Dr. D. T. Patton, Vice-President; E. R. Prince, Secretary and Treasurer; J. F. Sillings, Superintendent; Rev. O. W. Ransom, General Agent. The address of the company is Apopka, Orange County, Florida.

**Louisville & Nashville.**—At the annual meeting in Louisville, Ky., Oct. 2, the following directors were chosen: E. D. Standiford, H. V. Newcomb, B. F. Guthrie, W. B. Caldwell, W. H. Smith, H. C. Murrell, W. M. Farrington, Geo. A. Washington, P. J. Potter, James W. Hays, J. Guthrie Coke. The only new director is Mr. Coke, who succeeds G. H. Hutchings. The board re-elected E. D. Standiford, President; H. Victor Newcomb, Vice-President; W. Ranney, Secretary; A. M. Quarrier, Assistant Secretary.

**Louisville, New Albany & Chicago.**—Mr. A. B. Southard has been appointed General Freight Agent, with office at Lafayette, Ind.

**Missouri, Kansas & Texas.**—Mr. George W. Lilly has been appointed General Freight Agent. He has been Assistant General Freight Agent for several years.

**North Pacific Coast.**—Mr. John W. Doherty has been chosen President. He has been General Manager for some time, and will still retain that office.

**Passaic & Delaware.**—This company was organized at Morristown, N. J., Oct. 9, as successor to the New Jersey West Line, by the election of the following directors: John Brislin, Benjamin G. Clarke, Solomon Griffith, Percy R. Pyne, Andrew Reasoner, R. G. Rolston, Samuel Sloan, Moses Taylor, Jacob Vanatta. The board elected Samuel Sloan, President. The directors are all connected with the Delaware, Lackawanna & Western.

**Rhode Island & Massachusetts.**—At the annual meeting in Franklin, Mass., Oct. 2, the following directors were chosen: James M. Freeman, Edgar K. Ray, James P. Ray, Joseph G. Ray, Enoch G. Sweet, A. C. Whipple, G. W. Wiggin. The board elected James P. Ray, President; G. W. Wiggin, Clerk; Joseph G. Ray, Treasurer. The road is leased to the New York & New England.

**St. Johns & Indian River.**—Mr. Francis J. Le Baron, of Boston, has been appointed Chief Engineer, and has his headquarters at Titusville, Volusia County, Florida.

**St. Louis & Toledo.**—Col. Thomas Snell, of Clinton, Ill., is President of this new company.

**Southern Minnesota.**—Mr. Peter M. Meyers, Vice-President and Secretary, has been appointed Acting General Manager also, in place of Mr. W. C. Van Horne, who has gone to the Chicago & Alton. Mr. Van Horne, however, continues President of this company. Mr. J. M. Egan, late Assistant Superintendent, is appointed General Superintendent.

**Southern Minnesota Extension.**—The officers of this company are as follows: President, J. C. Easton; Vice-President, W. C. Van Horne; Secretary, J. K. Brown; Treasurer, H. G. Haugan.

**Southern Pacific, of Arizona.**—This company was organized at Yuma, Oct. 8, by the election of the following directors: D. D. Colton, A. P. K. Safford, Charles Hudson, Geo. Tyng, Charles F. Crocker. The board elected D. D. Colton, President; A. P. K. Safford, Vice-President; H. M. Wright, Secretary; F. S. Doney, Treasurer.

**Western Union Telegraph.**—At the annual meeting in New York, Oct. 9, the following directors were chosen: Norvin Green, Wm. H. Vanderbilt, Edwin D. Morgan, Augustus Schell, Harrison Durkee, James H. Banker, Samuel F. Barger, Joseph Harker, Alonzo B. Cornell, Hamilton McK. Twombly, John Van Horne, Cornelius Vanderbilt, Moses Taylor, Wilson G. Hunt, Edwards S. Safford, Cambridge Livingston, Chester W. Chapin, Robert Lenox Kennedy, J. Pierpont Morgan, George M. Pullman, John R. Duff, Darius O. Mills, Oliver H. Palmer, Samuel A. Munson, David Jones, Anson Stager, Edwin D. Worcester, Henry M. Phillips, William D. Bishop.

#### PERSONAL.

—Col. M. B. Prichard, General Manager of the Memphis & Little Rock road, died last week at Concord, Mass., his native place, which he was visiting on account of his health. He was 56 years old, and was well known as a large contractor.

—Mr. Wm. Wainwright, General Passenger Agent of the Grand Trunk Railway, was married in Detroit, Sept. 19, to Miss Mary E. Arnold, of Toronto.

—Mr. W. H. Brown, President of the Fort Dodge & Fort Ridgeley Company, is Democratic candidate for Congress in the Fort Dodge District in Iowa. Mr. Brown, however, is not making a very active canvass, his railroad duties absorbing most of his time.

—Mr. H. H. Weakley has resigned his position as Land Commissioner of the Chicago, St. Paul & Minneapolis Company. He has held the position for the company and its predecessor (the West Wisconsin) since 1871.

—Mr. O. L. Gardner, Train Dispatcher of the Cumberland Valley Railroad, was married, Oct. 4, to Miss Mary G. Reed, of Chambersburg, Pa.

—Hon. William A. Thomson, a director of the Canada Southern Company, died, Oct. 1, at his residence near Queens-town, Ont., aged 63 years. He was born in Scotland, but came to America when 18 years old, settling first at Buffalo and afterward in Canada. He was the projector and chief owner of the Erie & Niagara road, and one of the first projectors and the first President of the Canada Southern. He represented his district in the Canadian Parliament several years.

—Mr. John Penn, the eminent English mechanical engineer, died Sept. 23, aged 73 years. He succeeded his father as a manufacturer of machinery at Greenwich, near London, and soon turned his attention to marine engines, becoming one of the most noted builders of such engines in the world, and originating many valuable improvements. He retired some years ago, leaving his business to his sons.

—Mr. George Parker Bidder, an eminent English engineer died Sept. 20, aged 72 years. In early life he was assistant to Robert Stephenson and remained with him for many years. He was engaged on many important railroads in England and abroad, especially in India, and also had charge of some extensive docks and other engineering works. He was one of the first constructors of telegraph lines in England, and was largely interested in them.

#### TRAFFIC AND EARNINGS.

##### Railroad Earnings.

Earnings for various periods are reported as follows:

Year ending Aug. 31:	1877-78.	1876-77.	Inc. or Dec.	P. c.
Central of Georgia and leased lines...	\$2,721,624	\$2,439,853	I.	\$281,771 11.5
Expenses.....	1,598,314	1,508,365	D.	51
Net earnings.....	\$1,123,310	\$941,488	I.	\$281,822 33.5
Earnings per mile.....	3,814	3,444	I.	397 11.5
P. c. of expenses.....	58.72	65.51	D.	6.79 10.2

Nine months ending Sept. 30:

	1878.	1877.		
Atchison, Topeka & Santa Fe.....	\$2,720,136	\$1,754,427	I.	\$971,709 55.4
Bur., Cedar Rap. & Northern.....	1,131,878	809,809	I.	322,069 39.8
Central Pacific.....	12,937,303	12,033,937	I.	903,366 7.5
Chicago & Alton.....	3,448,121	3,310,330	I.	137,791 4.2
Chicago, Mil. & St. Paul.....	6,105,000	5,369,812	I.	735,188 13.7
Chicago & N. W. proper.....	10,034,804	8,593,055	I.	1,441,749 16.8
Denver & Rio Gr'de.....	792,475	543,722	I.	248,753 45.8
Grand Trunk.....	6,470,833	6,711,784	D.	240,951 3.6
Gt. Western of Can. & Pac. ....	3,310,618	3,119,045	I.	191,573 6.1
Ill. Central, Illinois lines.....	4,071,704	3,728,725	I.	342,979 9.2
Ill. Central, Iowa lines.....	1,083,293	1,029,300	I.	53,993 5.2
Kansas Pacific.....	2,578,667	2,270,893	I.	307,774 13.5
Mo., Kansas & Texas.....	2,100,756	2,314,584	D.	213,828 9.2
St. Louis, Iron Mt. & So. ....	2,933,712	3,005,230	D.	71,518 2.4
St. Louis, Kan. City & No. ....	2,378,079	2,228,910	I.	149,169 6.7
Toledo, Peoria & Warsaw.....	961,270	810,727	I.	150,543 18.6
Union Pacific.....	9,032,600	9,073,669	D.	21,069 0.2
Wabash.....	3,687,389	3,342,000	I.	345,389 10.3

Eight months ending Aug. 31:

Galveston, Har. & San Antonio.....	\$728,993	\$588,804	I.	\$140,189 23.8
Union Pacific.....	7,888,634	8,038,436	D.	149,802 1.9
Net earnings.....	4,550,482	4,655,498	D.	105,016 2.3

Five months ending Aug. 31:

Ogdenburg & Lake Champlain.....	\$218,795	\$201,743	D.	\$17,052 7.8
Net earnings.....	36,856	112,549	D.	75,693 67.3

Four months ending Sept. 30:

Chicago & N. W. ....	\$4,954,373	\$4,922,879	I.	\$31,494 0.6
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\*Three months ending June 30:

Cin., Hamilton & Dayton and leased lines.....	\$519,386	\$535,515	D.	\$16,129 3.0
Net earnings.....	155,632	149,087	I.	6,545 4.4

Month of July:

Grand Trunk.....	\$132,017	\$143,289	D.	\$11,272 7.2
Net earnings.....	24,181	29,625	D.	5,444 18.4

Month of August:

Atlantic & Great Western.....	\$369,761	\$421,483	D.	\$51,722 12.3
Galveston, Har. & San Antonio.....	116,083	99,140	I.	16,943 17.1

Month of September:

Atchison, Topeka & Santa Fe.....	\$421,000	\$275,042	I.	\$145,958 53.1
Bur., Cedar Rap. & Northern.....	138,897	194,226	D.	55,329 28.5
Central Pacific.....	1,831,000	1,441,293	I.	389,707 27.0
Chicago & Alton.....	447,125	480,933	D.	33,808 7.0
Chi. & Eastern Ill. ....	72,494	69,658	I.	2,836 8.7
Chi., Mil. & St. Paul.....	677,000	1,179,000	D.	502,000 42.6
Chicago & N. W. proper.....	1,345,796	1,559,368	D.	213,572 13.7
Chi. & N. W. proper.....	106,704	136,074	D.	29,370 21.6
Denver & Rio Gr'de.....	112,630	78,737	I.	33,893 43.1
Ill. Central, Illinois lines.....	485,698	607,713	D.	122,015 20.1
Ill. Central, Iowa lines.....	129,931	209,639	D.	79,708 38.0
Kansas Pacific.....	403,307	346,691	I.	56,616 16.3
Mo., Kan. & Texas.....	330,235	307,179	I.	23,056 7.5
St. Louis, Iron Mt. & So. ....	416,800	421,605	D.	4,805 1.1
St. Louis, Kan. City & No. ....	321,362	321,180	I.	182 0.1
Toledo, Peoria & Warsaw.....	125,109	116,591	I.	8,518 7.3
Union Pacific.....	1,163,426	1,035,232	I.	128,194 12.4
Wabash.....	540,024	462,901	I.	77,123 16.7

Week ending Sept. 27:

Gt. Western of Can. ....	\$98,454	\$138,907	D.	\$40,453 29.1
Week ending Sept. 28:				
Grand Trunk.....	\$197,600	\$228,056	D.	\$30,456 13.3

##### Grain Movement.

For the week ending Sept. 28, receipts of grain of all kinds at the eight principal Northwestern markets, in bushels, have been for the past six years:

	1878.	1877.	1876.	1875.	1874.	1873.
5,317,775	7,338,814	6,217,476	5,012,745	4,059,940	3,844,748	

The receipts of the week this year are 27 per cent.—two million bushels—less than in the corresponding week of 1877 and 15 per cent. less than in 1876. They are the smallest this year for eight weeks.

The shipments of the same markets for the same week were:

	1878.	1877.	1876.	1875.	1874.	1873.
4,484,885	5,090,778	4,225,204	3,317,358	2,820,543	3,458,829	

The shipments this year are 12 per cent. less than for the corresponding week last year, but larger than for any previous year. They are the smallest for eight weeks this year.

The quantities and percentages of these shipments which were sent by rail were:

	1878.	1877.	1876.	1875.	1874.	1873.
1,306,668	1,119,690	1,797,847	1,235,921	370,089	1,094,079	
20.1 p. c.	22.0 p. c.	42.5 p. c.	37.3 p. c.	13.1 p. c.	31.6 p. c.	

The rail shipments are considerably larger than for the two weeks preceding, and were positively large—never equaled so early in the season last year, and not often much exceeded this year since May—not even in June and July, when 15 or 16 cents per 100 lbs. were ordinary rates.

For the same week receipts at the seven Atlantic ports have been:

	1878.	1877.	1876.	1875.	1874.	1873.
5,606,994	5,790,479	3,192,147	3,000,941	3,600,931	3,847,979	

This year the receipts have been about 3 per cent. less than

for the corresponding week last year, but still very much greater than for the corresponding week in any previous year.

Of the receipts this year, 55.7 per cent. was at New York, 15.4 at Philadelphia, 14.2 at Baltimore, 9.5 at Montreal, 5 at Boston and 0.2 per cent. at Portland.

For the nine months from Jan. 1 to Sept. 28 the total movement has been as follows, for five years:

Northwestern Receipts:					
	1878.	1877.	1876.	1875.	1874.
Flour, bbls.	4,118,636	3,158,146	3,822,303	3,390,398	
Grain, bush.	169,750,272	118,860,110	134,644,912	107,078,154	135,539,026
Northwestern Shipments:					
	1878.	1877.	1876.	1875.	1874.
Flour, bbls.	4,190,077	3,346,735	3,146,319	3,725,224	
Grain, bush.	132,569,345	98,437,242	112,608,642	108,317,011	100,978,744

Atlantic Receipts:					
	1878.	1877.	1876.	1875.	1874.
Flour, bbls.	6,583,743	5,255,550	6,917,132	6,725,804	
Grain, bush.	182,402,501	104,445,837	120,704,122	90,050,212	90,317,587

The totals from 1873 to this date were all smaller than for 1874, and this year of grain of all kinds (not including flour) the Northwestern receipts have been 25 1/2 per cent. greater, the Northwestern shipments 17 1/2 per cent. greater and the Atlantic receipts more than fifty per cent. greater than for the corresponding nine months of any previous year.

For the week ending Oct. 7 receipts and shipments at Chicago and Milwaukee were:

	Receipts.	Shipments.
Chicago.....	3,489,179	3,078,871
Milwaukee.....	900,900	428,600

This is a considerable increase in receipts over the preceding week.

At Buffalo for the same week receipts and shipments were:

	Receipts.	Shipments.
By rail.....	464,300	645,880
By water.....	3,910,308	2,310,324

Total..... 4,374,608 2,956,204

The receipts are much larger, but the shipments much smaller than for the preceding week.

For the same week receipts at four Atlantic ports were:

	1878.	1877.	Increase.	P. c.
New York.....	4,385,818	3,489,179	896,639	25.7
Philadelphia.....	950,200	789,604	160,596	20.3
Baltimore.....	1,200,000	1,000,000	200,000	20.0
Boston.....	1,000,000	800,000	200,000	25.0

The New York receipts for the week have been exceeded but once this year and but twice last year. The proportion of them arriving by rail was unusually small—861,659 bushels, or about 19 1/2 per cent.

Receipts and shipments at Peoria for the nine months ending with September were, in bushels:

	1878.	1877.	Increase.	P. c.
Receipts.....	10,985,207	7,450,450	3,534,757	47.4
Shipments.....	8,761,245	5,658,850	3,102,395	54.8

The receipts of the nine months of this year are greater than those of the whole year 1877.

Exports for the months of August and September are reported as follows:

	1878.	1877.	Increase.	P. c.
From New York.....	19,895,305	9,625,823	10,269,482	106.7
" Boston.....	2,868,798	1,121,439	1,747,359	155.8
" Philadelphia.....	5,494,430	2,506,580	2,987,850	119.5
" Baltimore.....	8,302,337	4,014,788	4,287,549	106.6
Total.....	36,560,870	17,268,550	19,292,320	111.7

This year 54 per cent. of the whole was from New York against 56 per cent. last year, and of the total increase in the business 59 per cent. was obtained by New York.

The exports for these two months are equal to one-third of the total exports of these ports in 1877.

San Francisco wheat exports for September were 2,957,622 bushels, the largest ever made, except in October, 1876. Nine cargoes went to France, one to Callao, Peru, and one to Cape Town, South Africa; the rest to England. The exports for the three months of the California crop year ending Sept. 30 were: 1878, 6,099,043; 1877, 1,296,440; increase, 4,802,603 bushels, or 381.6 per cent.

##### Coal Movement.

Coal tonnages for the nine months ending Sept. 28 are reported as follows, the tonnage in each case being only that originating on the line to which it is credited:

<i>Anthracite:</i>	1878.	1877.	Inc. or Dec.	P. c.
Philadelphia & Reading.....	3,416,149	4,916,701	D. 1,490,552	30.5
Northern Central, Shamokin Div., and Summit Br. R. R. ....	531,903	436,468	I. 95,435	21.9
Danville, Hazleton & Wilkesbarre.....	23,580	19,032	I. 4,548	23.9
Pennsylvania Canal.....	245,105	241,242	I. 3,953	1.6
Central of N. J., Lehigh Div.....	1,600,371	1,948,735	D. 348,364	17.9
Lehigh Valley.....	2,577,885	2,695,125	D. 177,240	23.9
Penn. and New York.....	22,616	32,393	D. 10,315	31.4
Del., Lack. & Westchester.....	1,428,821	1,378,682	I. 50,139	13.6
Del. & Hudson Canal Co. ....	1,488,878	1,354,546	I. 204,332	15.9
Pennsylvania Coal Co. ....	608,568	717,415	D. 108,847	14.9
State Line & Sullivan.....	23,703	13,145	I. 10,558	80.6
Total Anthracite.....	11,723,079	13,922,092	D. 2,199,883	15.8



Of the total this year 419,104 tons were from the Lehigh, and 105,901 tons from the Wyoming Region. Actual tonnage passing over the Pennsylvania & New York road for the ten months of its fiscal year from Dec. 1 to Sept. 28 was as follows:

	1878.	1877.	Decrease.	P. c.
Anthracite.....	611,486	633,524	22,038	3.5
Bituminous.....	257,668	279,047	21,379	7.9

Total..... 869,154 913,171 44,017 4.8

Actual tonnage passing over the Huntingdon & Broad Top road for the nine months ending Sept. 28 was:

	1878.	1877.	Inc. or Dec.	P. c.
Broad Top.....	108,401	102,374	6,027	5.9
Cumberland.....	101,333	121,588	20,255	16.7

Total..... 209,734 223,962 D. 14,228 6.4

During the month of September the Tennessee Coal & Railroad Company shipped from its Seawanee mines, near Tracy City, Tenn., 8,028 tons of coal and 145 car-loads, or 83,243 bushels of coke.

Coal shipments from Pictou, Nova Scotia, for the nine months to Sept. 28 were: 1878, 104,032; 1877, 117,413; decrease, 13,381 tons, or 11.4 per cent.

#### Iron Ore Movement.

Shipments of iron ore from the Lake Superior region up to Sept. 28 are reported as follows:

	1878.	1877.	Inc. or Dec.	P. c.
From Marquette, tons.....	427,259	458,030	D. 30,771	6.7
From Escanaba.....	339,845	305,842	I. 34,003	11.1
From L'Anse.....	25,644	51,831	D. 26,187	55.5

Total..... 792,748 815,703 D. 22,955 2.8

#### Lake and Canal Rates.

The Buffalo Commercial Advertiser says: "The immense movement of grain this season is gradually bringing about an improvement in all branches of transportation. The average freight by lake and canal last month was higher than in any September since 1875, as will be seen from the following statement of the average rate on wheat and corn by lake from Chicago to Buffalo, and the average on the same cereals from Buffalo to New York by canal for the month of September in the years named:

Year.	Wheat, Cts.	Corn, Cts.	Wheat, Cts.	Corn, Cts.
1869.....	6.5	4.0	10.0	13.7
1870.....	5.6	4.1	10.8	10.9
1871.....	9.6	9.0	11.3	12.5
1872.....	14.8	13.8	12.5	11.6
1873.....	12.6	11.6	11.8	10.1
1874.....	3.5	3.2	9.5	8.5
1875.....	2.5	2.2	7.0	6.4
1876.....	2.6	2.3	6.2	5.6
1877.....	4.0	3.4	7.7	6.7
1878.....	4.4	4.1	8.0	7.1

"The average on wheat by lake last month was more than a cent in advance of the rate for August this year, and nearly three cents higher by canal. The change is of course very acceptable to carriers, who have been doing business for nothing so long that they had begun to despair of ever making any more money.

"It must not be inferred from this, however, that there is a fortune in owning a vessel this year. The average rates by lake are fairly remunerative and that is all. Large-class vessels can make a pretty good profit at four cents on wheat from Chicago; but small carriers will have little left from a four-cent rate, after all expenses are paid. The business at present, however, is so much better than it has been for years that everybody is disposed to be satisfied."

#### Petroleum Movement.

The exports for four years have been, for the ten months from Jan. 1 to Sept. 28, as follows, in gallons:

	1878.	1877.	1876.	1875.
New York.....	101,308,283	193,249,477	106,752,010	112,046,508
Boston.....	2,378,187	3,315,915	2,105,946	1,883,082
Philadelphia.....	41,745,209	33,044,161	49,815,503	47,713,208
Baltimore.....	36,748,737	32,545,953	29,704,470	31,121,042
Richmond.....	141,000	4,881,289	.....	.....
Portland.....	214,999	1,392,788	.....	.....
Norfolk.....	.....	391,100	.....	.....

Total..... 232,536,435 268,870,683 188,468,019 183,363,900

The exports this year have been 13½ per cent. less than in 1877, but 44 per cent. more than in 1876, 27 per cent. more than in 1875, 23 per cent. more than in 1874, 34½ per cent. more than in 1873 and 114 per cent. more than in 1872. The most notable change in the exports of the different ports is the large increase at Philadelphia, which still leaves it, however, with much smaller exports than before 1877. The percentage of total exports from each of the four leading ports for five years has been:

	1878.	1877.	1876.	1875.	1874.
New York.....	69.4	71.9	56.6	61.5	64.4
Philadelphia.....	18.0	12.3	26.4	26.0	31.8
Baltimore.....	11.5	12.1	15.9	11.5	2.3
Boston.....	1.0	1.3	1.1	1.0	1.5

In proportions thus Philadelphia gains, compared with last year, at the expense of all the other ports. Last year Richmond, Portland and Norfolk together exported 2.4 per cent. of the total; this year, not 0.2 per cent.

#### Lumber Traffic.

The Northwestern Lumberman gives the following reports of the trade of the year:

Chicago receipts and shipments for the nine months ending with September have been:

	1878.	1877.	Inc. or Dec.	P. c.
Lumber, ft.....	828,136,189	755,112,777	Inc.	71,023,412 9.4
Shingles, No.....	477,339,700	368,967,000	"	108,372,700 29.4

Shipments:  
Lumber, ft..... 449,301,063 431,829,061 " 17,472,002 4.0  
Shingles, No..... 90,688,275 123,641,450 Dec. 32,953,175 26.7

The shipments of lumber to the interior are a pretty fair gauge of the prosperity of the farmers; but the Chicago business alone does not suffice for this; the lumber produced on the upper Mississippi is largely distributed from Mississippi River points, and Toledo competes with Chicago for the supply of a large part of the territory south of the latitude of Chicago, though Chicago is by far the largest lumber market.

The heavy immigration to prairie districts last fall and spring has increased the demand for lumber, and this is probably a reason why there has been so great an increase this year on the Chicago, Burlington & Quincy, one of the lines leading to the states where immigration has been large. The shipments by it for the seven months ending with July have been reported as follows, in feet:

	1878.	1877.	1876.
77,405,960	48,562,903	40,484,100	

That is, this year's shipments by this road were nearly 60 per cent. greater than last year, and 91 per cent. greater than in 1876.

Shipments from the Saginaw River, probably the greatest

single producing centre, for the nine months ending with September have been:

	1878.	1877.	1876.
Lumber, ft.....	400,716,928	408,390,265	346,075,239
Shingles, No.....	137,044,880	109,351,850	91,567,050

This year's lumber shipments are 2 per cent. less than those of 1877 and 16½ per cent. more than those of 1876. The shingle shipments this year are 25½ per cent. greater than last year and 50 per cent. greater than in 1876.

The shipments from Minneapolis, the most important manufacturing and shipping market of the Upper Mississippi, have been for the same nine months:

	1878.	1877.	1876.
73,187,500	92,748,000	112,062,000	

This year the amount is 21 per cent. less than last year and 35 per cent. less than in 1876.

Comparatively a small part of the Saginaw shipments go to Lake Michigan ports for distribution, but Detroit, Toledo, and the country thence south, southwest, southeast and east are largely supplied from Saginaw.

The business of the upper Mississippi is said to have been largely diverted to Chicago this year.

#### Pork Packing.

The reports of the number of hogs packed in the Northwest (the leading packing cities being Chicago, Indianapolis, Cleveland, Cedar Rapids, Cincinnati and St. Louis) for the seven months from March 1 to Oct. 2 of what is called the "summer packing season" show an aggregate of 2,768,951 this year against 2,105,143 last year, an increase of 663,808, or 31½ per cent. The percentages of the total packed at the several places were as follows:

	1878.	1877.
Chicago.....	61.8	60.1
Indianapolis.....	9.4	8.5
Cleveland.....	6.9	6.1
Cedar Rapids.....	6.0	4.5
Cincinnati.....	4.7	5.5
St. Louis.....	4.5	6.0
Milwaukee.....	2.2	1.7
Other places.....	4.5	7.6

Total..... 100.0 100.0

The summer packing, which is comparatively a new business in the Northwest, grows chiefly at the more northern places where ice, great quantities of which are required in this business, is cheap. This year the summer packing of Chicago for seven-eighths of the season has been 1,710,000, against 2,501,285 packed in the four months of the last "winter season," or two-thirds as many. In the winter season an average of 625,321 per month were packed; so far in the summer season, 244,275.

#### RAILROAD LAW.

##### Killing Stock.

The following are stock cases recently decided by the Indiana Supreme Court:

1. Downey against the Jeffersonville, Madison & Indianapolis.—Held, That the complaint to be good against the Pennsylvania Company, the lessee of the appellant, should contain the averment that such lessee was running the Jeffersonville, Madison & Indianapolis Railroad in the name of the latter road. Where two mules are tied together and only one is struck by a locomotive and killed and dragged a distance on the road, the mule not struck being dragged after the one struck and thus injured, the owner cannot recover for the one not struck. It is the law in this state that an animal killed or injured by a railroad train, to render the road liable for its value, must be struck by some part of the train, by which it is claimed it was killed or injured. And this rule will operate in a case where two or more animals are tied together and placed in proximity to the track of the road. By being tied together each is disabled to act with its natural freedom in avoiding danger.

2. Barton against the Detroit, Eel River & Illinois.—Held (1) The complaint was good. (2) When the special finding of facts is inconsistent with the general verdict, the former shall control the latter, and the court shall give judgment accordingly. The inconsistency, however, must be clear, or the judgment must follow the general verdict. (3) Contributing negligence on the part of the appellee in permitting his cow to run at large would not justify the willful killing of such cow by the appellant when it could have been avoided by ordinary diligence.

3. Blodgett against the Detroit, Eel River & Illinois.—Action by the appellee to recover damages of the appellant for stock killed. It is objected to the complaint that there is not a sufficient obligation that the railroad was "not securely fenced in" where the killing of the stock occurred; that the language "not securely fenced in" is not equivalent to "securely fenced in." Held that this objection is not well taken. Held, also, that it is the settled rule of this court that it will not disturb the verdict of a jury on the weight of the evidence.

##### Right of Way—Agreement to Fence.

In Harris against the Cincinnati, Wabash & Michigan, the Indiana Supreme Court held:

"(1) The code has not abolished the distinction between actions sounding in tort and those sounding in contract; nor can causes of action of the two classes be joined. (2) The appellee executed to the appellant a release or conveyance of the right of way through his land, in consideration of the benefits which would result from the construction of the appellant's railroad, and in consideration that the appellant should fence the road in six months time, etc. Held: That there could be no implied obligation resting upon the defendant to keep stock off the plaintiff's land during the progress of the construction of the road. The right to construct the road upon the land carried with it necessarily the right to enter upon the land and remove such fences or other obstructions as were necessary to be removed in order to the accomplishment of the purpose. In the absence of any contract on the part of the railroad company to keep up the fences or to keep the stock off the plaintiff's land during the construction of the road, the plaintiff cannot recover for damage caused to his crop by stock. The provision that the road was to be fenced within six months after it was constructed, and not while it was being constructed. Until the road was constructed there was no road to fence."

##### Negligence in Cases of Personal Injury.

In the case of the State of Maryland, use of Foy, against the Philadelphia, Wilmington & Baltimore Company, the decision is summed up as follows:

"In order to maintain action against a railroad company for injuries received, etc., it must be proved that the injury was caused by the negligence of defendant or its agents; and it must not appear from the evidence that want of ordinary care and prudence on the part of the person injured directly contributed to the injury.

"Railroad companies, while prosecuting their lawful business, are bound to use ordinary and reasonable care to avoid inflicting injuries upon others. Railroad trains are liable to be detained by various causes, without any fault of

the company, and negligence cannot be imputed to the company from the fact that a train may be behind the usual time.

"The fact of negligence is for the jury to decide, where there is evidence legally sufficient to prove it, but in the absence of such evidence it is the duty of the court to withhold the case from the jury. The *onus probandi* as to negligence on the part of the company is on the plaintiff, as it is the ground of his action."

#### Forfeiture of Charter in Wisconsin.

The following is from the decision of the Wisconsin Supreme Court ordering a writ of *quo warranto* to issue in the Milwaukee, Lake Shore & Western case:

"The statutes of this state relating to the levy of attachment or execution upon shares of stockholders in corporations, to proceedings by or against corporations, and to the exercise of the visitatorial powers of the state over them, as well as the act regulating the duties of the Railroad Commissioner, and the general act concerning railroad corporations, under which the defendant was organized, and other statutes, require, at least by necessary implication, that the principal place of business, the records and the residence of the principal officers of private corporations created by this state, shall be within the state, at least so far as may be necessary to give full effect to those statutes; and the charter of such a corporation may be adjudged forfeited for continued neglect of such duty, under chapter 283 of the law of 1874.

"Independently of statutes, it is the duty of a private corporation to keep its principal place of business, its records, and the residence of its officers, so located as to render it accessible to the process and to the exercise of the visitatorial power of the state by which it is created, and a forfeiture may be adjudged for violation of this common law obligation.

"An information showing that the principal office of the defendant company is in the city of New York; that its books and records have always been kept in that city; that none of its principal officers reside in this state; and that by reason of these facts it has been impossible to enforce an attachment against the shares of stockholders in the company in actions brought in courts of this state, in accordance with the laws thereof, shows sufficient grounds for adjudging a forfeiture of the company's charter."

#### Change in Charter—Conditional Grant of Right of Way.

In Ross against the Chicago, Burlington & Quincy, the Illinois Supreme Court some time ago decided a number of points, among them the following:

The charter of a railway company will not be subject to the constitutional objection of embracing more than one subject from the fact that it authorizes the construction, etc., of one or more extensions of the principal line in different directions. The charter of the Peoria & Hannibal Railway Company is not obnoxious to this objection, as the extensions authorized are not regarded as independent and distinct lines from the main road.

Where a party gave his obligation to convey to a railway company a right of way over his land, and the charter of the company was afterward changed, and by subsequent enactment the company was authorized to divide its road into sections, and to let and construct any of them, which amendments were accepted by the company, and the party being a stockholder and director of the company expressly approved such amendments and acted under their authority and authorized and approved acts done under the same. Held, that he was not only bound by implication as a stockholder to the act of acceptance of the amendments, but also by his own acts as a director in exercising the new powers conferred, and was equitably estopped from alleging that the corporation had ceased to be that to which he became obligated.

If a railway company fails to commence work or complete its road in the time limited by its charter, the State alone can take advantage of the failure, and if it waives its right to do so, by extending the time, no one else can complain or set up such fact as a release from his contract with the company.

Even if a party who has given his obligations to a railway company to convey a right of way had a right to rescind the same for delay in the construction of the road, good faith would require him to give notice of such intention before the company takes possession of the land and constructs its road, so that it may adopt another location, or take proceedings to condemn before rendering itself otherwise liable.

When a party who had agreed to grant the right of way over his land to a railway company, after the construction of the road brought ejectment for the land so taken and also sued in trespass for damage; and afterward dismissed the same upon the agreement of the company operating the road to make a cattle-pass, the cost of which was to go in reduction of the owner's damages, which was constructed at a cost of \$800; Held on bill for specific performance by the company and to enjoin the prosecution of an action of ejectment for the possession of the land, that it would be inequitable to allow the owner to recover the possession of the right of way after inducing the company to incur this expense solely for his benefit, and after his election to take damages instead of the possession of the land.

#### Liability of Carrier over Connecting Lines.

In Phillips against the North Carolina Railroad Company, recently, the North Carolina Supreme Court held:

I. Common carriers may, by special contract, bind themselves to convey and deliver goods to points beyond their own line and outside the limits of the State wherein the road lies.

II. Where various companies form an association and unite in making a continuous line of their respective roads, and collect, either in advance at the place of receiving or at the place of delivery, the freight due for the entire route, subdividing among themselves, the receiving road becomes responsible for the default of any of the associated companies, and no special contract need be shown.

III. Where no such association exists, and no special contract is made, the receiving company discharges its duty by safely conveying over its own road and delivering to the next connecting road in the direct and usual line of common carriers toward the point of destination.

IV. Where there was no such association proven, and the railroad receipts given (after heading, marks, etc., named), read: "Received of A. B., to be laden on the freight cars, 1 bale bedding, etc., \* \* \* marks, etc., as per margin, which are to be delivered (condition of contents unknown) to — or assigns, at — Station."

And the plaintiff testified that he told the depot agent that he wanted the goods to go to Monroe, La., and offered to prepay the freight to that point, and the agent declined, telling the plaintiff to pay at Monroe on the bale arriving there; Held, There was no evidence of a special contract to go to the jury. The conversation with the agent was entirely consistent with a contract to convey only over its own road, if admissible at all to affect the written contract contained in the receipt, and the defendant—the name of station



of delivery being blank—is discharged upon delivery to the connecting road.

#### THE SCRAP HEAP.

##### Railroad Manufactures.

S. C. Forsaith & Co., of Manchester, N. H., last week shipped \$850 worth of tools to the St. Louis & Southeastern, and \$800 worth to the St. Joseph & Denver City road. They have recently sold Palmer power hammers to the New Jersey Midland road and to R. Hoe & Co., of New York, and Abbe patent bolt-forging machines to the Kansas Pacific road and the Keystone Nut & Bolt Works at Allegheny, Pa. They report business west and south as improving perceptibly, especially among railroads.

The Anthracite Fuel Co., at Rondout, N. Y., is supplying some of its fuel to the Central Vermont for experimental use. The fuel is used on the Delaware & Hudson Canal Company's lines.

Van Liew's patent grain-car door (illustrated in the *Railroad Gazette* of Nov. 30, 1877) has recently been put on new cars as follows: 1,000 built at Altoona and 1,000 at Fort Wayne for the Pittsburgh, Fort Wayne & Chicago road; 100 built by the St. Charles (Mo.) Car Co., and 300 by the Ohio Falls Car Co. for the Atchison, Topeka & Santa Fe; 200 built by the St. Louis Car Manufacturing Co. for the Chicago & Alton and 100 built by the same for the Missouri River, Fort Scott & Gulf. The Chicago & North-western has equipped an average of 200 cars monthly for twelve months past with these doors, and other roads are putting them in as cars are repaired.

The Hudson Paper Car-Wheel Works, at Hudson, N. Y., are running night and day to fill orders.

Speedwell and Wythe furnaces, in Wythe County, Va., are now in blast.

W. H. McCurdy & Co., of Cleveland, O., have the contract for all the iron work for the new breakwater at Cleveland.

The Cleveland (O.) Rolling Mill Co. has leased part of the Union Mills, and will put them in operation at once.

Chattanooga Furnace, at Chattanooga, Tenn., is running on Bessemer pig iron for the Roane Iron Co.

The Missouri Furnace Co., of St. Louis, has both its furnaces in blast, and has leased the South St. Louis Furnace, also. The company is making Bessemer pig iron for the Joliet Iron & Steel Co.

The Appleton (Wis.) Furnace Co. has one stack in blast, making charcoal iron.

It is said that a new car-wheel foundry is to be established at Elizabethport, N. J.

The rolling mill at Brownsville, Pa., has been started up by Jones, Lewis & Co., a new firm. The mill is now making tube iron for the National Tube Works Co.

The Pittsburgh Forge & Iron Co. has added to its works the necessary machinery for making bolts and nuts.

Dilworth, Porter & Co., at Pittsburgh, are running steadily with a full force and turning out about 20 tons a day of railroad chairs and spikes.

The Allentown (Pa.) Rolling Mill Co. has started up its rail and puddling mills, with a prospect of running all winter.

Mr. Edward R. Andrews has recently crosscut at his works in South Boston two large lots of spruce for the South Boston Horse Railroad and the Union Horse Railroad, of Providence, R. I.

The rolling mill at Middlesex, Pa., is running single turn. The Jackson & Woodin Manufacturing Co., at Berwick, Pa., have orders on hand for 250 box cars, and in addition for 4,000 axles and 8,000 car wheels.

The Wason Manufacturing Co., at Brightwood, Mass., have orders for 37 more passenger cars for the New York Elevated Railroad, and for 10 cars for the Brooklyn City street road.

The New York, New Haven & Hartford shops, at New Haven, Conn., have just turned out a new passenger-engine with 18 by 24 in. cylinders, and 5½ ft. drivers. The shops are building another engine like this, and a light passenger engine with 13 by 24 in. cylinders.

The puddling mill of the Passaic Rolling Mill Co., at Paterson, N. J., was destroyed by fire on the night of Oct. 5. The building was of wood, most of it old, and was not very valuable, but the machinery within, including furnaces, boilers, four stationary engines, two steam pumps, etc., was damaged considerably. The fire spread very fast, but the firemen succeeded in saving the main rolling mill, machine shop and office buildings. The exact loss cannot be stated, as the damage to the machinery has not been fully ascertained, but it is thought to be about \$50,000, and nearly covered by insurance. The fire will not prevent the company from filling its contracts, only making it necessary to buy stock for the rolling mill.

##### Bridge Notes.

Clarke, Reeves & Co., of the Phoenixville (Pa.) Bridge Works, have received another large contract for the Quebec, Montreal, Ottawa & Occidental road. The contract is for one span of 250 ft. over the Ottawa River, four spans of 150 ft. each, two of 100 ft. each and one of 80 ft.

Jones & Benners, engineers and bridge-builders, of Philadelphia, have secured contracts for a bridge over Summer street, Boston, for the Old Colony road; a four-track iron bridge over Park street, in Hartford, Conn., for the joint use of the New York, New Haven & Hartford and the Hartford, Providence & Fishkill, and a draw-bridge at Tiverton, R. I. The iron work will be made by the Edge Moor Iron Co. and the Keystone Bridge Co.

Cofrade & Saylor, of the Philadelphia Bridge Works, at Pottstown, Pa., have the contract for the iron work for a new court-house at Wooster, O.

Nolan Brothers, of Reading, Pa., are building a new bridge for the Pittsburgh, Fort Wayne & Chicago road, at Wellsville, O., to replace one washed out by the recent freshet.

The Keystone Bridge Co., of Pittsburgh, has been awarded the contract for the 34 iron bridges and trestles required in completing the Cincinnati Southern. The contract for six of these is absolute, the work to be done at once; for the other 28 the contract is conditional, depending upon the decision of the courts as to the validity of the act authorizing the issue of bonds to complete the road.

The King Iron Bridge Co., of Cleveland, O., is building a bridge over the Cuyahoga River in Cleveland and for the Valley Railroad.

The Keystone Bridge Co. is to build a new three-span bridge at Warren, O., on the Atlantic & Great Western road, in place of one destroyed by the recent freshet.

##### Notes.

New York street railroad companies are all introducing the "bob-tail" or one-horse cars, in place of the larger two-horse cars. This is not the result of the opening of the elevated railroads, however, as an outsider might suppose. Certainly not; for the companies with one voice declare that they had long decided in favor of the "bob-tail"—their business, in fact, has rather improved since the elevated roads began to run, and the smaller cars are only put on to accommodate the larger travel. Outsiders, of course, are bound to believe, even if they do not exactly see the point.

An Indianapolis ticket agent rejoices in a revolving office

chair, made from Texas steer horns, four of which form the legs of the chair and six the arms and back.

An exchange gravely informs us that experiments are being made with a locomotive having driving wheels 5½ feet in diameter, and if they are successful, several roads will probably adopt them for use in passenger service. This will be appreciated by the many engineers who have been for years running engines with drivers of just that diameter.

An exchange, noting the killing of another drunken man by a train, says that the railroad track is the most popular inebriate asylum in that vicinity.

##### A Bridge Made of Old Rails.

A correspondent informs us that at the work shops of the Prince Edward's Island Railway, a bridge is being constructed from old iron rails. The plan of the bridge is a lattice girder, 31 feet span. The top chord is formed of three rails laid parallel; the bottom chord is formed in like manner, the lower rails being placed in an inverted position. The diagonal bracing is formed of short pieces of rails, bent at the upper and lower ends and twisted with a half-turn in the middle, so as to cause the flanges to come in conjunction with the flanges of the top and bottom chords. The flanges are then riveted together with ¾-inch rivets. At each place where the braces and counters meet the chord, a half-inch iron plate is introduced, which binds the three rails of the chord together. The rails used are 40-lb. iron of the Sandberg pattern. The bridge is designed by Mr. G. C. Cunningham, Chief Engineer of the road.

##### Railway Branch, Young Men's Christian Association.

The branch at Columbus, O., of which Mr. M. P. Ford is President, reports the usual religious services held each Sunday in September at the Union Depot and three sermons preached. The death of Yardmaster John Harpham, an active member, is reported. During the month the attendance at the rooms included 4,208 readers and 491 at the Sunday services; 22 books were received at the library; 500 papers were received, 451 distributed and 357 filed; 16 caboose and 12 switch-houses were visited and supplied with reading matter. A number of letters were written, stamps and postal cards given; several visits were paid to the sick and one funeral attended.

##### Contributions for the Yellow-Fever Sufferers.

The Chicago & Northwestern Railway contributions to the yellow-fever fund up to Sept. 30 were as follows:

Galena Division.....	\$598.65
Iowa ".....	1,045.50
Madison ".....	623.80
Winona & St. Peter Division.....	250.78
Wisconsin ".....	311.25
Milwaukee ".....	232.50
Peninsula ".....	257.50
General offices.....	405.00
Chicago shops.....	480.04
Chicago, St. Paul & Minneapolis Railway.....	78.75
Miscellaneous.....	7.60
	\$4,300.37

The employees of the Western & Atlantic Railroad have contributed over \$1,000 for the yellow-fever sufferers, including a special fund of \$902.65 for their fellow-employees at Water Valley, Miss., where the Chicago, St. Louis & New Orleans shops are located.

##### Old Engines.

There is at present owned and operated by the Troy & Boston Railroad Company a locomotive that possesses quite a local history. It is known as the "Pony," and has been at the same humble vocation of yard duty for the past twenty-six years, or since the Troy & Boston Railroad was started. The locomotive is an oddity, by reason of its peculiar construction and the wide difference from its associates, being devoid of tender or forward truck, is very low, and has only two driving wheels on each side. The coal and water tank and cab all rest above the boiler, giving it a huddled or dromedary appearance. The lack of forward wheels imparts to its movements a jerky motion at all times. Forty-six years ago it was purchased, with two others of similar make, by the Rensselaer & Saratoga Company, and used to draw passenger trains between Troy and Saratoga. The three were named the Ajax (now the Pony), Hector, and Agamemnon. The other two have long since been superannuated and passed into oblivion. When first utilized hereabouts, in the year 1852, the old style of "strap rails" was in vogue, and railroading, compared with its present development, was rather primitive. Like the Irishman's boat that lasted seven years, the pony has been so often rebuilt that there is probably not a bolt or nut of the original structure left, yet the locomotive has been known about here for almost half a century.—*Troy (N. Y.) Times*.

A locomotive is running on one of our Boston roads that was built in 1846, but has been so thoroughly overhauled from time to time that scarcely \$75 worth of the original metal is upon her. This fact suggests the occasional incident in New England that a locomotive will run through the repair shop and nothing of the original remain but the name, and that will be cast upon a new plate.—*Boston Advertiser*.

##### Travels of Raw Material.

The Plattsburgh (N. Y.) *Republican*, in an article on the extensive works of the Chateaugay Iron Co., and the excellence of the iron produced there, calls for its extensive manufacture at home, and points the significance of this suggestion by the following illustration: "The fact recently came to light that the tires and some other of the most important parts of the three-foot gauge engine 'Centennial'—which is to be used on the Dannemora Railroad, and after which many of our readers rode over the railway on the Centennial grounds at Philadelphia—were manufactured from iron ore taken from the Chateaugay ore bed. This was, of course, not the result of a design in order to make a case, but because that iron was the best that could be found for the purpose. Thus the iron ore was mined in Chateaugay, shipped to Cleveland, Ohio, where it was smelted and rolled, returned to Scranton, Pa., to be manufactured into a locomotive, which now comes back under the shadow of its native mountain, within 16 miles of its own bed, and may yet be heard rumbling out through the Chateaugay forest, over the ore bed and down the valley."

##### Improved Cattle Cars in England.

The Royal Society for the Prevention of Cruelty to Animals having offered £400 in prizes for improved railway cattle trucks, the judges in June last inspected fifty-five competing models, and selected four, which they requested the inventors to build of the full size, in order that, if necessary, a practical trial of their capabilities might be made. Three of these trucks have now been completed, and one inventor has been allowed further time. The traffic managers of the railway companies expressed their readiness to facilitate the proposed trials and to adopt a simple, light, cheap, safe and workable method of watering animals in transit, if only the objectionable features hitherto found existing in most proposals of the kind can be really removed.

#### OLD AND NEW ROADS.

**Brattleboro & White Hall.**—The contract for building this road from Brattleboro, Vt., to Londonderry, 35 miles, has been awarded to Col. L. M. Morrison, of Lock Haven, Pa. Col. Morrison has also a residence in Bennington, Vt., where he passes much of his time. The contract price is \$295,000, or about \$8,400 per mile, and the contractor agrees to take \$120,000 in first-mortgage bonds and \$175,000 in cash. The road is to be of 2 feet gauge.

**Bureau of Pacific Railroad Accounts.**—A Washington dispatch of Oct. 4 says: "The Auditor of Pacific Railroad Accounts has prepared a list of 19 blank forms, which are being forwarded to the various roads placed under his supervision by the act of June 19 last, and which the proper officers of the several companies are required to fill up and return to the Auditor. In the reports presented on these blanks the railroad companies must show monthly the financial condition of their respective roads, the amount of revenue derived from all sources, the number of through and way passengers and tons carried, a statement of the expenses of the transportation of passengers and the amount paid for salaries and incidental expenses, the amount expended for interest as funded and floating debt premiums, exchange, taxes, etc., new construction and equipments, improvements, etc. In addition to these monthly reports, a number of semi-annual reports are required. These must contain itemized statements of the number and class of officers and employees, and their average monthly pay; names and residences of stockholders, and number of shares held by each; a statement of the funded debt and sinking funds by classes, giving the amount of the principal and interest issued, paid, and outstanding; a statement of the capital stock, giving the number of shares authorized, subscribed for, and paid for in cash or otherwise; the quantity of lands acquired and disposed of; a list of stocks and bonds of other railroads and corporations, giving the cost of the same and how paid for, and a number of others, covering every branch and department of the business and operations of the Pacific railroads."

**Callia Furnace.**—Arrangements are being made to build a road about five miles long from Callia Furnace, near Clifton Forge, Va., to connect with the Chesapeake & Ohio. It is to be of standard gauge.

**Cauca Valley.**—A telegram from Panama says that on the 15th of September work was commenced in the port of Buena Ventura on the projected railroad to connect the valley of the Cauca, in the United States of Colombia, with the Pacific. The work is considered one of the most important that has been begun in this republic for many years. On the 20th over 200 laborers were employed on the road. The contractor, F. J. Cisneros, long a resident of New York, is also building the railroad in the state of Antioquia. On the latter work a large number of Italians, who came by way of the United States are employed.

**Central of Iowa.**—In the matter of the complaint of several coal companies on the line of this road, charging discrimination against the road, it was set forth that the late Receiver made a contract with the Consolidation Coal Company, by which, in order to secure the coal trade at certain points, the coal company was to reduce its charges to \$1.35 per ton, and the railroad to reduce its freight rates to three-quarters of a cent per ton per mile. The company was to supply coal for the use of the road at \$1.30 per ton, and the road was not to reduce rates to other coal shippers. The Iowa Railroad Commissioners have decided that the contract was against public policy, as it virtually made the road a partner with the Consolidation Coal Company, and discriminated against others. The contract was also decided to be contrary to the interests of the road, and the Receiver was held not to be bound by it. In regard to the distribution of cars, the Commissioners held that the road was bound to have cars enough to meet all ordinary demands, but in case of an extraordinary and unexpected call cars should be distributed *pro rata* to shippers.

The Commissioners did not pass upon the question of reduction of rates to large customers, as it was held not to be involved in the present case.

**Cincinnati, Hamilton & Dayton.**—This company reports earnings of its own and leased lines as follows, for the three months ending June 30:

	Earnings.	Expenses.	Net earn.
Cin., Ham. & Dayton.....	\$204,723	\$135,969	\$68,754
Dayton & Michigan.....	191,918	137,443	54,475
Cin., Richmond & Chicago.....	44,088	35,420	8,668
Cin., Ham. & Indianapolis.....	78,657	54,922	23,735
Total.....	\$519,386	\$363,754	\$155,632
Total, 1877.....	535,515	386,428	149,087
Increase or decrease.....	D. 16,129	D. 22,674	I. 6,545
Per cent.....	3.0	5.0	4.4

The decrease in gross earnings was on the Dayton & Michigan, the other lines showing a small gain. The decrease in expenses was nearly all on the Cincinnati, Hamilton & Indianapolis.

**Cincinnati, Rockford & Southwestern.**—This road has been completed and opened for business to Henryville, Ind., two miles north of the old terminus at Ferdinand, and 26 miles from Rockford.

**Cincinnati Southern.**—R. G. Huston & Co., the contractors for the completion of this road, have sub-let to Daniel Callahan the contract for the work from the present terminus at Somerset, Ky., south to the coal-fields, 19 miles. They have also let the contract for six bridges on this section to the Keystone Bridge Company. They have let to the same company conditionally the contract for the other iron bridges required, 28 in number. Any further sub-lettings have been postponed until a decision can be had in the suit brought to enjoin the trustees from issuing the \$2,000,000 additional bonds for the completion of the road.

In view of this pending suit and the uncertainty of its results, Messrs. Huston & Co. have requested the trustees to modify the contract so that the twelve months within which that part of the road south of the coal fields must be finished shall not begin to run until the Supreme Court shall have decided in favor of the validity of the proposed issue. Their reasons for the request are the time which will be required to build the iron bridges, and the injustice of requiring them to pay out large sums of money for this work, when it is uncertain whether they will receive anything in return.

**Denver, South Park & Pacific.**—This road is now completed and opened for business to Bailey, in Park County, Col., 54 miles from Denver, and 47 miles from Black Creek Junction, where the extension leaves the old line to Morrison, which was built several years ago. The nine miles from Black Creek Junction to Morrison are retained as a branch. The stations on the new line are Littleton, Platte Cañon, Deanes, South Platte, Dome Rock, Buffalo, Pine Grove, Estabrook Park and Bailey.

**Duck River Valley.**—Contracts have been let for the



extension of this road from Lewisburg, Tenn., southwest to Petersburg, and work is now in progress on the grading.

**Eastern.**—Pursuant to the resolutions adopted at the special meeting held Sept. 30, stockholders were allowed to vote until Oct. 7 on the question of ratifying the amended leases of the Eastern, in New Hampshire, and the Portsmouth, Great Falls & Conway roads. At the close of the polls the committee appointed to count the votes reported that 27,144 shares had been voted in favor of ratifying the leases, and only 54 against.

On the same day, however, on application of three of the stockholders, the Massachusetts Supreme Court issued an order to the company to appear and show cause why an injunction should not issue to prevent the execution of the leases. The order is returnable Oct. 25. The petitioners allege that the new leases are contrary to the interests of the stockholders, and that they were carried through by parties interested in the securities of the leased roads.

The Eastern in New Hampshire was originally leased many years ago, the lessee agreeing to pay the same dividends on the stock of the leased road as on its own. Consequently no rent whatever has been paid for several years, the lessee having paid no dividends, and suits have been begun to set aside the lease. The new agreement provides that all suits shall be withdrawn and that the Eastern Company shall pay an annual rental of \$22,500, which will pay a dividend of 4½ per cent. on the stock of the New Hampshire Company.

The new lease of the Portsmouth, Great Falls & Conway provides that the Eastern Company shall pay the yearly interest (\$45,000) on \$1,000,000 new 4½ per cent. mortgage bonds, which the Conway Company issues to take up its old 7 per cent. non-mortgage bonds; in case, also, that the Eastern should hereafter pay dividends, it agrees to pay an equal dividend to the Portsmouth, Great Falls & Conway stockholders. In the case of this road also some pending litigation is to be discontinued. Another change in the lease of the Conway road is that the new lease is made directly to the Eastern Company, while the old one was to the Eastern in New Hampshire. It should be noted that the Eastern holds \$486,000 of the \$1,000,000 Conway bonds.

**Eastern, in New Hampshire.**—At the special meeting in Portsmouth, N. H., Oct. 1, a majority of the stock was represented, and the holders voted unanimously to approve the agreement with the Eastern, of Massachusetts, and the amended lease of the road to that company.

**Elberton Air Line.**—The track on this road has reached Royston, Ga., 30 miles east by south from the connection with the Atlanta & Charlotte Air Line at Toccoa City, leaving 20 miles to be laid to reach Elberton. Some delay has been caused by the temporary closing of the rolling mills at Chattanooga, where part of the rails were made, but iron for 10 miles is on hand, and the Atlanta mill is making the rest. A regular train is now run to Royston, and the company hopes to have the road open to Elberton by November.

**Equitable Pipe Line.**—It is reported "on good authority," that contracts have been concluded for the construction of a pipe line from the Bradford region to Harrisburg, Pa. The Equitable Oil Company, the Philadelphia & Reading and the Central of New Jersey, are said to be parties to the contract.

**European & North American.**—The officers of this road report that during the year ending Sept. 30, 1878, there was no accident on the road resulting in injury to any passenger or employé, or causing damage to the company's property to the amount of \$100.

**Fort Wayne, Jackson & Saginaw.**—The United States Circuit Court has denied the application of the trustees for a summary order to put them in possession of the road. Only a short time had elapsed since the filing of the bill, and the answer was not yet due; moreover, the officers of the company admitted the default, and offered to appear and confess judgment of foreclosure. As the company was willing to facilitate the proceedings, and there were no allegations of fraud or mismanagement, the Court did not think it necessary to appoint a receiver, or to put the trustees in possession. The company then filed an answer admitting the default.

**Hannibal & St. Joseph.**—Notice is given that 25 of this company's sinking-fund land-grant bonds were drawn for redemption Oct. 4, in accordance with the provisions of the mortgage, and will be paid on presentation to the Farmers' Loan & Trust Company in New York. The interest on the bonds drawn will cease Dec. 3. The numbers drawn are: 49, 82, 87, 136, 140, 194, 212, 226, 237, 321, 326, 371, 396, 429, 450, 457, 524, 696, 701, 732, 734, 739, 778, 798, 802.

**Hartford, Providence & Fishkill.**—The Boston Advertiser of Oct. 8 says: "The answer of the trustees to the bill of the New York & New England Railroad Company, pending in the United States Court at Hartford, asking for the right to redeem the existing mortgage and for the transfer of the property, was filed on Saturday. The answer sets forth the bringing of the petition by the Boston & Providence Railroad Company, the trustees of the estate of Earl P. Mason, Henry Gardner and others, as stockholders of the Hartford, Providence & Fishkill Railroad Company—in the state court, praying for an injunction against the transfer of the property by the trustees, and returnable to the November term of Court, and asks that the petitioners be made parties to this suit. An early hearing is expected this week, and whether the controversy is to be fought out in the United States or state court, time will determine. Up to Saturday night the New York & New England Treasurer had received about \$850,000 of the bonds, leaving \$150,000 outstanding in the hands of the public. The other million is held by the cities of Providence and Hartford. There is about \$575,000 to the credit of the sinking fund held by these cities, of which the courts will decide the ownership. The city of Providence refuses to surrender its bonds until the question of the right of redemption at issue in bill now pending in the Supreme Court of Rhode Island—similar to the suit just brought in Connecticut—has been decided.

"It was said at the last meeting of the City Council of Hartford that its members were unanimous in favor of surrendering its bonds. The matter is to be voted on at the next meeting, Oct. 14, 1878. Whether the bringing of the suit since will influence their action remains to be seen. It is said that the trustees are working harmoniously with the New York & New England, and it is hoped the delay in ascertaining the rights of the parties will not be serious."

**Illinois Central.**—The Land Department reports that during the month of September 7,439.60 acres of land were sold for \$3,148.80. The cash collected on land contracts was \$5,722.60.

The traffic on the lines in Illinois was \$485,698, against \$607,712.02 in September, 1877, a decrease of \$122,014.02, or 20.1 per cent. There was a decrease on the Iowa Division of \$79,707.64, making the total decrease in both States for the month \$201,722.26. The decline in earnings is mainly attributable to the smaller receipts of wheat from the Iowa Line as compared with the large business of September, 1877. Owing to the wet weather threshing has been delayed, and shipments have been lighter. Passenger

business South was practically suspended in September, owing to the yellow fever.

**Indianapolis, Bloomington & Western.**—The injunctions restraining county collectors from levying or selling the property of this company in Illinois for taxes unpaid have been continued by the United States Circuit Court until Nov. 15 for the Main Line and until Jan. 1 for the Western Extension.

In Chicago, Oct. 8, the United States Circuit Court decided that the decree of foreclosure should stand. The Court held that the right of redemption after foreclosure given by the laws of Illinois and Indiana applied only to private property and did not cover railroad property; a railroad mortgage also included the franchise and other property, as well as the real estate.

**Indianapolis, Cincinnati & Lafayette.**—In the United States Circuit Court at Indianapolis, Oct. 9, a decree of foreclosure was granted of a mortgage for \$50,000 on certain property in Indianapolis, purchased by the company from the Indianapolis Water Works Company, and situated at the crossing of the canal. It is claimed, however, that the Water Works Company had no real title to the canal property, but that it was vested in property owners along the line, and an appeal will probably be taken from the decree.

**Kansas Pacific.**—Application has been made to Justice Miller of the Supreme Court, sitting in Washington as Circuit Judge, for the removal of Henry Villard, one of the Receivers of this road. The application is opposed by counsel for the Denver Extension bondholders, who ask that Mr. Villard may be retained to represent their interest in the road. After hearing argument decision was reserved, and will be announced at Atchison, Kan., next week.

Mr. Adolphus Meier, trustee under the land mortgage, has issued a circular in which he states that up to July 31 there had been redeemed \$422,000 of the bonds, leaving \$1,567,000 outstanding. On July 31 there were in hand \$15,204 in cash, \$865,000 in land notes well secured and about 1,800,000 acres unsold lands. Should the Secretary of the Interior's decision be sustained and the land be opened to preemption at \$1.25 per acre, the land would yield \$2,250,000, or enough to pay off the land bonds and leave a surplus for the second-mortgage land bonds. The trustee believes, however, that the decision will not be sustained. Instructions have been given to the Land Commissioner to receive the bonds at par and accrued interest for all land payments.

**Lafayette, Muncie & Bloomington.**—Receiver Chapman reports for September as follows:

Balance, Sept. 1.....	\$22,483.21
Receipts.....	38,836.32
Total.....	\$61,319.53
Expenditures on old account.....	\$5,188.56
" " new account.....	27,387.84
	32,576.40

Balance, Oct. 1.....	\$28,743.13
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The receipts exceeded the disbursements by \$6,259.92 for the month.

**Lake Champlain & St. Lawrence.**—This Canadian road is now completed from Farnham, P. Q., northward to St. Guillaume, about 45 miles, and trains are to begin running next week. The road is of 3 ft. 6 in. gauge.

**Louisville & Nashville.**—At the annual meeting in Louisville, Oct. 2, the stockholders voted unanimously to approve the contract made by the board for the completion and lease of the Cumberland & Ohio Railroad, South Division.

A resolution abolishing the pass system was offered by a stockholder, but was laid on the table after some discussion.

**Metropolitan Elevated.**—A dispatch from Albany, N. Y., Oct. 9, says: "Attorney-General Schoonmaker has received from the Clerk of General Sessions a certified copy of the presentment of the Grand Jury against the elevated railroad. He says, in regard to it, that it has no force and he can take no action in regard to it. It is apparently an evasion rather than an action. If there had been evidence before the Grand Jury to warrant an indictment, they should have made the indictment themselves. Except as an opinion of several very respectable gentlemen, it had no force whatever."

"The Attorney-General stated further that he would be in New York on Friday, the 11th inst., and in some room of the court-house at 11 a. m. would resume the hearing in the matter of the complaint against the elevated railway, submitted to him some time ago. That was an application to him to commence an action for the dissolution of the corporation, and it was consequently a matter of which he should take cognizance. The petition was not supported by affidavits and proofs, and usually he would reject petitions so unsupported, but the matter was of such vital interest to New York that he did not feel at liberty to act upon it or reject it without hearing reasons for and against it. The effect of his bringing a suit and winning it against the corporation would be to cause a dissolution of the corporation. The materials of the road could, of course, be sold, but whether the railway would have to be dismantled, and the traffic on these particular lines discontinued would depend upon the question whether a new corporation or owner can succeed, with the property, to the franchises and privileges granted especially to another."

**Missouri, Iowa & Nebraska.**—It is again stated that this company has made arrangements to change its eastern terminus from Alexandria, Mo., to Keokuk, Ia., and that it has secured the use of the Keokuk & Des Moines track and depot in that place.

**Nashua & Lowell.**—The arrangements for the separate operation of this road were not carried out after all. The directors of the company met those of the Boston & Lowell in Boston, Oct. 2, when it was decided to continue the running of the two roads as heretofore, under direction of Manager Hosford, until a hearing is had upon the injunction and the lease is put in form for the acceptance of the stockholders.

**New Jersey West Line.**—The purchasers of this road at the recent foreclosure sale have organized the Passaic & Delaware Railroad, fixing the capital stock at \$1,000,000. None of the old owners appear in the reorganization, all the officers of the new company being connected with the Delaware, Lackawanna & Western, which has purchased the road.

The line is completed from Summit, N. J., west to Bernardsville, about 16 miles, but this section has been allowed to fall into very bad condition and has not been worked for two or three months past. It will now be repaired and put in operation at once. It is also graded from Summit east to Lyons' Farms, near Newark, but it is not likely that this section will be completed, although the graded line from Summit to Milburn may be finished and used as a loop line for the Morris & Essex Division, to avoid the heavy grades and sharp curves east of Summit. The line from Summit to Bernardsville will doubtless be worked as a branch of the Morris & Essex Division.

**New York, Lake Erie & Western.**—The third rail is now laid to Susquehanna, 22 miles east of Binghamton, where the last reports left it. The work is progressing on the Delaware Division between Susquehanna and Port Jervis.

In the matter of the application made in August by Henry C. Ohlen for a peremptory mandamus to require the company to receive and transport such crude petroleum for him as he might offer for transportation upon payment of the accustomed rate, Judge Van Brunt, of the New York Supreme Court, gave his decision Oct. 8. The opinion set aside the point made on behalf of the railroad company, that the mandamus should not be granted because there was an adequate remedy at law, and holding that the cases established the principle that the Court will by mandamus compel a railroad corporation to fully and fairly fulfill the obligation which it took upon itself at the time of the acceptance of its franchises and as compensation therefor. Among the duties imposed by the general railroad law is to carry freight upon its road and to furnish sufficient accommodations for the transportation of such freight within a reasonable time after the same is offered for transportation.

As to the claim on behalf of the company, that it was not bound to furnish tank cars, Judge Van Brunt decides that it is bound to furnish to all its customers the same facilities, and can make no distinction. If tank cars are peculiarly suitable to the transportation of any particular kind of freight, and the company furnishes them to one customer, it cannot refuse them to another, at any rate when it has them idle, as in this case. The law requires the furnishing of sufficient accommodation, and accommodation not suitable cannot be sufficient. Tank cars being recognized as the most suitable for the transportation of oil, Mr. Ohlen had the right to the use of such cars for the transportation of his oil. But Judge Van Brunt decides, in conclusion, that the alternative mandamus asks too much, as it commands the company immediately upon the receipt of the writ to receive and transport, etc., when the law only requires the company to transport within a reasonable time. He therefore refuses a peremptory mandamus.

The complaint in the suit charged that cars were refused to Mr. Ohlen, while the road had a number idle, and that it was at the time carrying oil for Pratt & Co., (a firm which combines with the Standard Oil Company), at much below the regular rates, which Mr. Ohlen offered.

**New York, Pittsburgh & Chicago.**—A contract has been let for the building of this projected narrow-gauge road from Huntington, Ind., eastward to Ossian, about 16 miles.

**Ogdensburg & Lake Champlain.**—The following statement is published for the five months of the fiscal year from April 1 to Aug. 31:

	1878.	1877.	Inc. or Dec.	P. c.
Gross earnings.....	\$218,704.96	\$201,743.01	D. \$16,961.95	10.4
Expenses.....	181,938.48	149,183.62	I. 32,754.86	21.9
Net earnings.....	\$36,856.48	\$112,549.40	D. \$75,693.01	67.3
Interest on bonds.....				
Five months.....	30,300.00	30,832.25	I. 2,467.75	8.0
Surplus.....	\$3,556.48	\$81,717.24	D. \$78,160.76	95.7
Dividend on pref'd stock, five mo's.....	60,666.67	60,666.67		
Deficit, or surplus.....	\$63,110.19	\$15,050.57		

The decrease in gross earnings has been continuous for some time, and in the last three months has been about 22 per cent. This, with the increase in expenses, leaves very little this year for the preferred stock, after paying interest.

**Oil Transportation.**—The investigation into the charges of discrimination made by oil shippers was continued last week at Pittsburgh. The testimony taken was chiefly in confirmation of that already heard.

As a result of the investigation, Deputy Attorney General Gilbert appeared before the Pennsylvania Supreme Court in Pittsburgh, Oct. 7, and filed in behalf of the State a bill in equity against the Pennsylvania Railroad Company, citing numerous discriminations and other unlawful acts. The bill also charges an unlawful combination between the defendant, the Standard Oil Company, of Cleveland, O., the United Pipe Lines, under its former and present organization, the Acme Oil Company, the Erie Railway Company and its successor, the New York, Lake Erie & Western Company, the Atlantic & Great Western Railroad Company, the Lake Shore & Michigan Southern Railway Company, the New York Central & Hudson River Railroad Company and the Pittsburgh, Titusville & Buffalo Railroad Company, and asks for an injunction to prevent further discriminations and combinations, and for such further relief as the Court may decide to be necessary in the case.

Similar bills were also filed against the Dunkirk, Allegheny Valley & Pittsburgh, the Lake Shore & Michigan Southern, the Atlantic & Great Western and the United Pipe Lines.

On presentation of the bills some discussion arose as to whether leave should be granted to file them in the Supreme Court. It was urged that the matter was of too great importance to be delayed, and that it came properly before the Supreme Court and not before any inferior court. The Court finally took the papers, reserving its decision as to taking jurisdiction of the case.

In reference to this case, President Scott has written the following letter, dated Oct. 7, addressed to the stockholders of the Pennsylvania Railroad Company: "I am advised by telegraph to-day that application has been made by the Deputy Attorney General of the Commonwealth to the Supreme Court, at Pittsburgh, for permission to file bills against various railroad companies, and among others the Pennsylvania Railroad Company, alleging in the bill against this company a combination with the Standard Oil Company, Pipe Lines and other railroad companies, to control the entire business of producing, buying, selling and transporting oil, and that in carrying out this combination it has made unlawful discriminations, etc. I desire to state that the Pennsylvania Railroad Company is in no possible combination in regard to producing, buying, selling or otherwise dealing in oil, and that it does not believe it has made any unlawful discrimination at any time, or under any circumstances, and upon the hearing of the case, if it ever comes to a hearing, it will make this very plain to any court before whom it may be heard. If any shippers or producers of oil feel themselves aggrieved, the courts are open at their individual instance for any redress that may be due them. The whole movement seems to rest on *ex parte* testimony entirely, as this company has never been given an opportunity to be heard on the subject. I am not, therefore, surprised at the Supreme Court hesitating—as shown by the questions addressed by the Justices to the Deputy Attorney General—about taking jurisdiction of the matter. I desire to repeat that all charges or allegations to the effect that this company or any of its officers are in any way, directly or indirectly, interested, either with the Standard Oil Company or any other party, in the production, buying, selling or trafficking in any way in oil, are without foundation in fact. Why your company should be assailed in this manner and at this time will, perhaps, be made plain to you at no distant day."



**Old Colony.**—An unusually fatal accident occurred on this road on the afternoon of Oct. 8. A heavy excursion train, drawn by two engines, returning to Boston from a regatta at Silver Lake, was thrown from the track at Wollaston Foundry siding, and both engines were thrown over upon their sides and three passenger cars were piled up on the top of them and badly wrecked. The first three cars kept the track and ran past the engines and it was the two following cars which were wrecked. The latest accounts received report 22 killed, 4 missing and 126 wounded, some severely, but a number slightly.

As to the cause of the accident, it appears that a local freight had been switching some cars at that point, although the excursion train was over-due. It was an extra, but due notice had been given of its running. It is not as yet very clear just how the accident was caused, whether by the switches left open by the freight (which had to cross the inward-bound track to reach the siding) or by striking some of the cars of the freight, which were still on the same track with the passenger. The clearest accounts, however, state that the engines had left the track before striking the freight cars. There is to be an inquest, and the Railroad Commissioners will also investigate the accident, so that the facts in the case will be pretty well brought out.

The accident is the worst that has happened near Boston since the Revere disaster on the Eastern road, and the most fatal we have recorded since the Ashtabula disaster. It will undoubtedly cost the company a large sum for personal damages, and this view of the case caused a sharp decline in the company's stock. On Tuesday it was selling on the Boston Stock Exchange at 103½, but on Wednesday it varied from 87 to 90. The Old Colony is a well-managed road, and a serious accident is something unusual.

**Philadelphia & Reading.**—This company is preparing plans for several steam colliers to be used in the Mediterranean trade, which the company hopes to establish. These vessels will be fitted to bring back return cargoes of fruit and other articles usually exported from Mediterranean ports.

**St. Louis, Iron Mountain & Southern.**—A St. Louis dispatch of Oct. 6 says: "Judge Dillon, of the United States Circuit Court, having further heard the case of the Union Trust Company, of New York, against the St. Louis, Iron Mountain & Southern Railroad Company, entered a decree yesterday that the equities of the case are with the complainant, and that the defendant is in default of interest on the consolidated mortgage bonds described in the bill, due April 1, 1877, and that the complainant is entitled to recover the amount thereof. He also declared that it be referred to a master in chancery to report the amount of interest due on these bonds at the time he files his report in court, and also as to who actually owns the coupons on these bonds."

**St. Louis, Kansas City & Northern.**—This company is negotiating for the exchange of its own bonds for the \$1,000,000 bonds of the St. Charles Bridge Company. The holders of those bonds have appointed a committee to represent them, but want to keep their 8 per cent. interest and some provision for a sinking fund.

**St. Paul & Sioux City.**—This company and the Sioux City & St. Paul have offered to carry grain to St. Paul at present at reduced rates, on account of the low grade of much of the crop along the line and the poor prices offered. The reduction from the regular local rates is 20 per cent. for No. 4 wheat and No. 3 barley, and 40 per cent. for rejected wheat and rejected barley.

**St. Louis & Toledo.**—This company was organized recently at Indianapolis to build a narrow-gauge air line from Toledo to East St. Louis. It is claimed that the proposed line will be 43 miles shorter than the Wabash between the same points, which would make it 391 miles long. The capital stock is to be \$1,000,000. The Indiana company will be consolidated hereafter with the organizations in Ohio and Illinois.

**Sharpsville.**—In the long litigation between this company and the Pennsylvania Company as to the grade crossing of the Erie & Pittsburgh road at Sharpsville, Pa., the Pennsylvania Court of Common Pleas has confirmed the Master's report and ordered a decree to be entered. The decree dissolves the preliminary injunction obtained by the Pennsylvania Company and permits the Sharpsville Company to build the grade crossing, the work to be done at its own cost and under the direction of a competent engineer to be chosen by the Pennsylvania Company. The Sharpsville Company is to keep the crossing in repair, pay a watchman and observe all reasonable rules, etc., as to crossing of trains.

The Sharpsville road has for years crossed the Erie & Pittsburgh at Sharpsville for the purpose of delivering coal to furnaces and to the canal. The present suit grew out of an attempt to make a new crossing to secure a better connection with the Sharon Extension of the Atlantic & Great Western, then lately completed, in order to be able to ship coal over that road to Cleveland.

**Southern Pacific.**—This company is now forwarding quantities of construction material to Yuma, and it is said that work will at once be begun on the extension of the road from Yuma east to Tucson under the organization lately effected in Arizona. The distance to Tucson is nearly 300 miles.

**Valley of Ohio.**—Work is progressing steadily and the road-bed is ready for the rails for 10 miles north from Akron, O., where track-laying will be begun. The bridge over the Cuyahoga River in Cleveland is being put up, and the other bridge work is well advanced.

**Victoria Railroads.**—For the last year reported (the calendar year 1877, we believe), the 981 miles of railroad in this colony of Australia earned £1,135,790, and the working expenses were 52½ per cent. Per mile of road in our currency the gross earnings were \$5,935, the working expenses \$3,094, and the net earnings \$2,841.

**Waukon & Mississippi.**—Iowa papers reports that this road has been sold to the Chicago, Clinton, Dubuque & Minnesota Company, with whose road it connects at Adams. The road was built last year, is of 3 ft. gauge, and runs from Adams, Ia., northwest to Waukon, 23 miles.

**Woodruff Sleeping and Parlor Coach Co.**—This company has purchased the cars, patents and franchises of the Lucas Sleeping Car Company. The Lucas Company had a number of cars running on routes in the South.

## ANNUAL REPORTS.

### Louisville & Nashville.

The report of the President for the year ending June 30, 1878, is, as usual, published in advance of the full report. The lines worked at the close of the year were as follows:

Main Stem, Louisville to Nashville.....	Miles.
Bardonia Branch, Junction to Bardonia, Ky.....	185.00
Knoxville Branch, Lebanon Junction, Ky., to Livingston.....	17.30
	110.30

Richmond Branch, Junction to Richmond, Ky.....	33.40
Cecilian Branch, Louisville to Cecilian Junction.....	45.54
Total Main Stem and branches.....	301.54
Memphis Line, Bowling Green, Ky., to Memphis, Tenn.....	256.10
Total owned.....	650.64
Glaagow Branch, leased, Junction to Glasgow, Ky.....	10.50
Nashville & Decatur R. R., leased, Nashville, Tenn., to Decatur, Ala.....	122.30
South & North Alabama R. R., controlled, Decatur to Montgomery.....	183.00
S. & N. Ala., Wetumpka Branch.....	7.00
	322.80

Total worked..... 973.44

The whole system forms a main line from Louisville to Montgomery, 490.3 miles long, with a principal branch to Memphis, and the other minor branches. The only change in the lines worked reported is the addition of the branch of the South & North Alabama from Elmore to Wetumpka, not completed, we believe, until about the close of the fiscal year.

The Secretary's statement of liabilities, cost and resources, somewhat condensed, is as follows:

<b>Liabilities:</b>	
Capital stock (\$13,845 per mile).....	\$9,067,818.82
Bonded debt (\$26,805 per mile).....	17,440,720.00
Bills payable, accounts and pay-rolls.....	\$1,947,601.47
Purchasing Committee, Cecilian Br.....	309,100.00
Back dividends, July and August.....	345,074.41
dividends and interest.....	2,592,675.88
Profit and loss account.....	3,301,764.85
Total.....	\$32,315,979.55
<b>Cost and resources:</b>	
Cost of road to June 30, 1878 (\$36,900 per mile).....	24,066,919.89
Due from Transportation Dept.....	\$227,199.81
Ten-year mortgage bonds.....	714,015.61
Cecilian Branch bonds.....	880,000.00
Sundry bonds and stocks.....	1,973,308.19
Bills and accounts receivable.....	427,892.42
Real estate, timber and quarry lands.....	959,454.94
S. & N. Ala., second mortgage bonds.....	1,000,000.00
S. & N. Ala. R. R. Co.....	575,875.49
Nashville & Decatur R. R. Co.....	389,023.93
Cecilian Branch.....	583,985.59
Shop and fuel stock.....	369,456.81
Cash, Louisville and New York.....	148,846.87
	8,249,050.66
Total.....	\$32,315,979.55

Capital stock was increased \$4,400 during the year. The bonded debt was increased by the issue of \$1,000,000 Cecilian Branch bonds (of which \$890,000 are reported still held by the company), and decreased by the redemption of \$43,510 bonds of various issues, making a net increase of \$956,490.

The bonded debt now consists of \$7,070,000 consolidated bonds; \$2,000,000 ten-year mortgage bonds; \$70,000 main office mortgage; \$1,000,000 Cecilian Branch bonds; \$3,500,000 Memphis & Ohio bonds; \$2,304,720 Memphis, Clarksville & Louisville bonds; \$88,000 Lebanon Branch bonds; \$558,000 Louisville city bonds on Lebanon Branch extension, and \$850,000 Louisville city bonds to Main Stem, which are not a mortgage on the property. During the year 20 Nashville & Decatur bonds and \$68,000 South & North Alabama bonds were purchased for their respective sinking funds.

The earnings of all the lines worked for the year were as follows:

	1877-78.	1876-77.	Increase.	P. c.
Gross earnings.....	\$5,607,598.48	\$5,315,326.80	\$292,271.68	5.5
Expenses.....	3,263,356.06	3,174,806.52	88,549.54	2.8
Net earnings.....	\$2,344,242.42	\$2,140,520.28	\$203,722.14	9.5
Gross earn. p. mile.....	5,802.32	5,048.00	154.32	3.7
Net ".....	2,425.65	2,274.00	151.65	6.7
Per cent. of exp's.....	58.20	59.72		

The net earnings of the Louisville & Nashville proper for the year were:

Net earnings.....	\$1,708,675.84
Interest on bonded and floating debt.....	1,024,284.35
Surplus.....	\$684,391.49

From this semi-annual dividends of 1½ per cent. each have been paid on the stock, amounting to \$270,174.

The result from the operations of the leased Nashville & Decatur road were as follows:

Gross earnings (\$6,032 per mile).....	\$737,750.37
Expenses (64.22 per cent.).....	400,111.82
Net earnings (\$2,761 per mile).....	\$337,644.55

Hire of equipment..... \$34,682.71

Interest on bonded debt..... 149,501.79

Dividends on stock..... 98,553.44

Surplus..... \$282,737.94

The net earnings of this line showed an increase over the previous year of \$74,799.18, or 28.5 per cent. Charges to construction account were \$21,966.65, making with previous years a total of \$283,125.85, which is to be reimbursed at the end of the lease.

The South & North Alabama showed for the year an increase of \$86,006.83, or 11.2 per cent., in gross, and of \$95,702.68, or 48.4 per cent., in net earnings. The result from the operations of this road were as follows:

Gross earnings (\$4,616 per mile).....	\$844,688.87
Expenses (65.23 per cent.).....	551,039.90
Net earnings (\$1,605 per mile).....	\$293,648.88

Hire of equipment..... \$74,466.17

Interest on bonded debt..... 345,930.96

Surplus..... 420,307.13

Deficit..... \$126,748.25

Add amount advanced on construction account..... 45,215.52

Purchase of 68 sterling bonds..... 62,696.77

Advances and interest on old account..... 95,055.54

Total advances for the year..... \$329,686.08

The advances for the previous year were \$486,449.16. As compared with 1873-74, the first full year of the operation of this road, the net earnings have increased 207.2 per cent.

President Standiford gives the following statement of gross and net earnings of all lines worked for six years with the comments below:

	1872-73.	1873-74.	1874-75.	1875-76.	1876-77.	1877-78.
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\$6,106,052 \$5,510,695 \$4,863,874 \$4,961,480 \$5,315,327 \$5,607,598

1,484,047 1,565,382 1,082,133 1,067,960 2,140,520 2,344,242

Net inc. 81,335 198,080 483,913 656,473 890,195

"The result in brief shows that the net earnings of your road have increased 58 per cent. since the panic, and as the advance has been stable and uniform in its character, it certainly demonstrates the enhanced value of your property since that time.

"These results have been reached with low rates of freight unparalleled in the history of your road. To show the low rates at which we are carrying traffic, compared with preceding years, it is only necessary to notice the fact that in the year before the panic we carried 177,466,795 tons of freight one mile, while in the past year we carried 224,654,

080, or an increase of 47,187,235, or 26 per cent., more traffic for considerably less revenue.

"In accomplishing this the road has in the meantime not been allowed to deteriorate, but its physical condition has been improved at least 50 per cent.

"In producing the results placed before you in this report, the management believe its success due to the strictest economy and the most careful supervision in every department by the best skilled officers that can be commanded—a policy from which the management do not think it safe to depart in the future.

"During the past few years the management has paid much attention to the development of the local traffic of the road. It has encouraged manufactures along its lines, and the results have proven the wisdom of its efforts in the large increase of local traffic, and it is believed that this policy should be continued.

"For the past few years the operations of the road have been very free from accidents to passenger trains. All roads are more or less liable to such accidents, and our immunity has been considered remarkable by railroad men. We regret to say, however, that late in June we had a severe accident, a collision arising from the inadvertence of skillful and experienced telegraph operators and train employés, which, while it did not injure any passenger, resulted in loss of life and serious bodily injury to several of the train employés. All claims justly arising from this accident were promptly settled, and the amount charged to the operations of the road in the past fiscal year."

The report, after referring to the strikes of 1877 at some length, continues: "Your Main Stem, extending from Louisville to Nashville, will compare most favorably with any road in the country. It is almost entirely laid with steel rail, thoroughly ballasted and all its appointments are in perfect keeping with a first-class road. The branches and the Memphis Line are also in good condition, and, as feeders to our main stem, play an important part in our system."

"The Cecilian Branch, which we have operated since January, 1877, has proven to be a wise investment. The receipts have increased largely, in many cases doubling those of the corresponding month of the previous year. Its purchase was made with the single idea of protecting our Main Stem against a ruinous competition continually threatened by a chain of bankrupt roads, which had it in their power at any time to very materially reduce our revenue without great danger to themselves. Not only has protection against this competition been firmly, and it is believed permanently secured, but the purchase has yielded us sufficient additional revenue for the large payments made on the road."

"We also pass a large business over the Main Stem between Louisville and Elizabethtown, which, when the Cecilian Branch was owned by the Louisville, Paducah & Southwestern road, was naturally diverted over the branch. This business is worth to us over \$50,000 net annually."

"Substantial improvements have been made along the line of your roads during the past fiscal year. A commodious passenger station has been finished at Montgomery, a new depot constructed at Columbia, a new iron bridge at heavy cost has been thrown over Duck River, and several minor structures have been erected.

"Better accommodations at Nashville and Memphis are needed, and steps have already been taken toward procuring the same in the former city."

"On all our roads we have laid large quantities of steel rails during the past year."

"During the year the company has received 15 locomotives from the Rogers Works, the balance of a lot contracted for before the panic, the completion of which was suspended by mutual agreement. New extensions are referred to as follows:

"We have, during the past year, built for the South & North Alabama Railroad the Wetumpka Branch. The road extends from Elmore to Wetumpka, a distance of seven miles. Its construction was demanded by a contract the South & North Alabama Railroad Company made for important advantages secured to itself in past years. The roads penetrate to the centre of a rich and fertile valley, and will be a valuable feeder to our system."

"At the close of the year negotiations were in progress, and have since been concluded, for the construction of that part of the Cumberland & Ohio road between Lebanon and Greensburg, Ky., about 31 miles in length. This road in its entirety was originally intended as a competitor of our own for valuable business, but its projectors failed for want of means after expending about four million dollars, and it having been thought desirable that our company should control the portion of it stated, and which had been offered us, a lease for 25 years was effected. By the terms of the lease we acquire the middle portion of the road, upon which about \$1,000,000 has already been expended, and to complete which it will take about \$180,000, for which sum we are secured by a first and only mortgage of \$800,000 on the road. The road penetrates a rich and fertile country, capable, under this new stimulus, of yielding a great traffic, not only to the projected road itself, but to others in our system."

"During the past year the company has added to its bonded debt one million dollars. This amount was placed in a mortgage on the Cecilian Branch, 46.3 miles long. The amount of the mortgage is very small for the property covered, it originally costing over two millions. This bond has not yet been placed upon the market, nor will it be until a fair price can be obtained."

"We have during the past year extended aid to the Brownsville & Ohio Railroad Company, which is building a road from Brownsville to Friendship, Tenn. Part of this road has already been built, and the whole, when completed, will form a valuable feeder to our system, as it penetrates a rich, agricultural country."

Reference is made to the progress of immigration and settlement, especially on the line of the South & North Alabama road, where soil and climate are very favorable. The success of the colony at Cullman has induced the settlement of several others, chiefly of Germans. The report concludes as follows:

"The coal and iron interests on the line of the South & North Alabama Railroad, upon which that road so much depends, are advancing very materially. New mines are opening, and the Eureka Company, the pioneer in the manufacture of iron in that section, has added largely to its interests in North Alabama. Its works at Oxmoor and Helena are of the most extensive character, and the amount of product they turn over to our line for transportation forms a very important element in our revenue."

"The coal and iron on the line of the South & North Alabama Railroad are practically inexhaustible, and as fast as new markets can be opened the product of our revenue will be largely increased."

"In conclusion, your directors feel that they may justly congratulate the stockholders upon the improved condition and future prospects of their property. The country along our line is increasing in prosperity and population, new feeders to our lines are continually opening up new and fertile sections of country, and our receipts are now, and we believe ever must be, ample to meet all fixed charges, and yield a surplus which we have no reason to doubt will annually increase until, at no distant day, your property will reach a value in earning capacity second to none in the country."